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Forest Regulations and Policy Objectives in Cameroon: An Economic Analysis

by

Clotilde Ngomba Mollo

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ABSTRACT

This study seeks to investigate the objectives of the forest policy in Cameroon, from 1980 to 2000. The policy is assessed using three fundamental development criteria. These include: efficiency, equity, and environmental soundness. The property rights approach is used to examine the major issues including: the adequacy of the policy objectives, their potential to lead to welfare improvement, their impact on firms' behavior, and the results achieved. The findings of this study suggest that significant improvements have been achieved on some specific objectives. However, the policy results on other policy objectives may have been lessened by: the existence of conflicting objectives; the inadequacy or lack of enforcement of some dimensions of property rights; and the lack of monitoring of policy implementation.

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LIST OF ABREVIATIONS

AAC- Annual Allowable Cut
FAO- Food and Agriculture Organization
GDP- Gross Domestic Product
GNP- Gross National Product
HDI- Human Development Index
HPI- Human Poverty Index
ITTO- International Tropical Timber Organization
MINEF- Ministry of Environment and Forestry
NFAP- National Forestry Action Plan
NTFP- Non Timber Forest Products
UNDP- United Nation Development Program
WWF- World Wide Fund for Nature

CHAPTER I: INTRODUCTION

The Government of Cameroon declared in 1993 that its new goal for the forestry sector is the sustainable management of the forest resources in order to maximize the contribution of the forest to the economic and social welfare of the people (MINEF, 1993). To that end, three specific policy objectives were set: (i) promotion of reduced impact logging in concessions, (ii) development of an economically efficient, high value-adding, and unsubsidized timber industry, and (iii) ensuring an equitable distribution of forest benefits to the population, over time (MINEF, 1993).

To pursue these objectives in the forestry sector, the Government of Cameroon introduced new forest regulations in 1994. The changes in the regulations translated mainly into a revision of the property rights design, in a way that was supposed to lead to successful accomplishment of the policy objectives. The new regulations were also supposed to provide incentives to the different stakeholders to comply with the new policy.

The announcement of the policy created controversy among the stakeholders. Firstly, some environmentalists challenged the policy on the grounds that reduced impact logging is an idealistic notion because logging and sustainability are antithetical by definition. Secondly, loggers argued that the policy goal of sustainable forest management (SFM) was not compatible with the three specific objectives. Logging firms were primarily concerned with the financial implications of the new policy resulting from regulatory changes to forest tenures. The management requirements associated with the new policy were perceived as a source of additional costs that would reduce the private net benefits expected from logging activities.

The announcement of the new policy came after an economic review of the forestry sector, which reported very poor sector performances and concluded that the old forest policy has failed to achieve its expected results (Catinot, 1989). The policy makers'

expectations under the old policy were that the regulations included in the Forestry Law (1981) would lead to the creation of a large domestic timber industry; the promotion of lumber exports; and the improvement of living conditions of forest neighboring communities. Despite some improvements under the new regime, there seem to be many shortcomings with the new policy, too. In both cases, no prior economic analysis of the policies was done to assess their ability to induce some welfare improvement.

The objective of this study is to contribute to a better understanding of the performance of the forestry sector in Cameroon over time, through an economic assessment of the policy tools and goals pursued. The specific objectives of this study are:

- describe the policy environment under the old and new policies in a property rights framework as proposed by Haley and Luckert (1990);
- discuss the adequacy of the policy objectives set by the Government, and assess the compatibility of specific objectives;
- investigate whether the policies had an impact on loggers' behavior as per the Government expectations;
- use the property rights framework to further discuss the results achieved in each specific objective, and check which results were predictable given the way regulations were set up.

The thesis is composed of six chapters. Chapter 2 outlines the framework for policy analysis. It includes a further description of the tools to be used in the economic analysis that follows. The concepts of policy efficiency, equity, and sustainability are presented as the economic criteria to measure the economic and social welfare derived from a policy. The rationale for choosing the property rights approach for this study is explained. Then, the property rights approach to policy analysis is presented. Chapter 3 presents a brief overview of the forestry sector in Cameroon. It describes the context of

the study, and provides insights into the importance of the sector resources and the sector players. Chapters 4 and 5 provide the background information for the old and the new policies, respectively. They include an outline of the policy objectives and a description of the property rights set up adopted towards the achievement of these objectives. Chapter 6 analyses sector achievements towards the policy objectives under the old and new policy regimes. It contains a condensation of objectives under the two successive regimes and a discussion on their adequacy and compatibility. It presents the investigation process to check which dimensions of property rights affected the individual specific objectives. The concluding chapter summarizes the results of the policy analysis, discusses the limitations of the study, and suggests areas for future research.

CHAPTER 2: FRAMEWORK OF POLICY ANALYSIS

This chapter presents a framework for describing the old and new forest policies in chapters 4 and 5, respectively, and for the policy analysis that is carried out in chapter 6. The first section presents a brief review of the literature related to the fundamental economic objectives of society, as pursued through public policies: efficiency, equity, and environmental soundness. This section also discusses the potential trade-offs between these three policy objectives. Section two presents the two-step approach used in this study for policy evaluation including a property rights analysis, and an assessment of results using indicators of performance. It provides reasons for choosing the property rights method in this study. The various dimensions or characteristics of property rights and their potential impact on policy objectives are discussed. A definition of conventional indicators associated with policy objectives is recalled; their availability and their possible utilization in the context of Cameroon is discussed.

2.1 Characteristics and tradeoffs of a welfare improving policy

2.1.1 Characteristics of a welfare improving policy

The appropriateness of a policy depends on whether the said policy is welfare improving. Economic literature suggests that a policy is likely to lead to a welfare improvement if it economically efficient and allows for social equity (Boadway and Bruce, 1984; Pearse, 1990; Norton and Alwang, 1993; Dinwiddy and Teal, 1996; Constanza *et al.*, 1997). Efficiency and equity therefore appear to be two fundamental objectives of society. Recently, in particular in the wake of the Brundtland report (1987), there has been an increasing concern about the environmental impact of development policies. The ability to maintain the carrying capacity of the environment has, therefore, also become a criterion for the evaluation of public policies.

Efficiency has to do with the costs and the gains of a particular policy, and relationships between the total value of the output and the total costs of the inputs. Efficiency requires that the absolute difference between value of outputs and costs of inputs be maximized (Clawson, 1975). The first welfare theorem states that an efficient allocation of goods and services can be achieved through decentralized market systems, under conditions which include: rational agents, complete information on prices, no externalities, and no monopoly (Boadway and Bruce, 1984). But, when markets are distorted, or do not exist, the existing structure of prices cannot be relied upon to allocate resources efficiently. In such cases, there may be grounds for public sector intervention, to correct market failures[1] and improve efficiency (Dinwiddy and Teal, 1996). In developing countries, market failures caused by lack of information, in the presence of uncertainty, faced by most individual producers and consumers may be particularly important. In the case of the forestry sector, government intervention is often thought to be required due to the market failure associated with environmental damage and the existence of externalities that may affect social welfare.

However, even if economic efficiency could be achieved through the market that would not be sufficient to ensure welfare improvement, since the distribution of the resources may not be equitable. Equity has to do with the relative division of resource flows among people, and over time. Equity includes considerations for the present and the future. Intra-generational, or cross-sectoral, equity deals with distribution of wealth among the poor and the well off in the current generation. Intergenerational, or inter-temporal, equity refers to distribution between the current and future generations. Inter-temporal equity has been associated with economic sustainability through concepts such as non-declining utility (Hartwick, 1977; Pearce *et al.*, 1990; Page, 1997).

[1] Market failure results when prices, which influence the production and consumption decisions of firms in the private sector, fail to reflect the benefits and costs of forest resource use to society (Haley and Luckert, 1990)

In addition to efficiency and equity, there are also issues of sustainable scales of an economy that are dependent on stocks of capital. Environmental soundness refers to the ability of a policy to avoid changing the natural stock of capital. The idea is that every development activity induces some damage that may in turn reduce the carrying capacity of the environment. The ideal is to ensure that the overall economic output in a country does not erode the country's environmental carrying capacity over time. In the case of exploitation of forest resources, damages may be related to the ecosystem, its biodiversity, and the ecological services it can provide. The capacity of the ecosystem to survive and reproduce with its key attributes is referred to as ecological sustainability (Constanza *et al.*, 1997).

2.1.2 Trade-offs between efficiency, equity and environmental soundness

The concepts of efficiency, equity and environmental soundness are distinct, but the problems associated with them are interrelated. Seeking to achieve the three goals in a coherent policy is not an easy task. The pursuit of one goal does not guarantee another is achieved; indeed goals may be conflicting in some cases. Some researchers (e.g. Constanza *et al.*, 1997) have suggested that the three goals be prioritized, with the environmental carrying capacity coming first, followed by distribution concerns, then efficiency. However, in the real world, government choices usually aim at facing practical social problems that do not necessarily follow this order. These social choices are one reason for the variety of policy options observed between countries.

Government policy options often imply trade-offs between efficiency, equity and environmental concerns. The objective for governments is generally to make policy that reflects a satisfactory combination of the three concerns.

2.2 Approaches to policy evaluation

Assessments of efficiency, equity, and environmental soundness of a policy can be approached in different ways. The approach in this study is dictated by the paucity of

data, the complex institutional structure, and the lack of projected outcomes that can be compared to specific targets. A two-step approach will be used to carry out the study. First, a property rights approach will be used to assess outcomes that may be predictable given changing property right structures. Then, selected performance indicators for the forestry sector will be discussed.

2.2.1 Property rights analysis

In order to address the institutional complexity that frequently surrounds resource use, some policy analysts have used the property rights approach, which allows assessments of incentives induced by the regulations associated with a policy. The property rights approach can provide insights into whether a policy is welfare improving, or would rather lead to economic inefficiencies and thereby, to non-optimal allocation of resources. In the regulation of private sector activities, property rights are important policy instruments for governments. Haley and Luckert (1998) note that "the functioning of an economy is, to a large extent, dependent on the nature of property rights which are created, defined, circumscribed, and granted through legal processes". Randall (1981) suggests that "a government which seeks the attainment of economic efficiency and of certain specific goals with respect to the distribution of economic well being, may seek to specify non-attenuated property rights, while attenuating the precise specifications of those rights in order to achieve its distributional goals". Young (1992) adds "well-designed resource rights mechanisms permit resource users to use new information and new technology, and pursue new market opportunities without having to negotiate a change of government policy. They encourage diversity, facilitate efficient solutions and avoid government failure". In the following sections, we present the process by which, the property rights designs affect firms' efficiency, distribution of welfare, and environmental damages in the forestry sector. First, the interrelation between forest tenures and property rights is discussed, then the individual characteristics of property rights are described and their potential impact on policy objectives is highlighted.

In the forestry sector, many governments grant harvesting rights to private firms in the form of forest tenures that are considered a form of property rights. Forest tenures are a bundle of rights, obligations and requirements by which governments transfer timber harvesting rights and forest management responsibilities from the public to the private sector, in the case of publicly owned forest resources. Haley and Luckert (1998) suggested "a property right is a socially sanctioned and enforceable claim of an individual or group to the pecuniary and non-pecuniary benefits flowing from property, subject to the conditions society places on the use of an asset or service". Tenure arrangements are of particular interest in the timber business. They are regarded as a central instrument of forest policies because they convey a signal about the asset value. The value of an asset depends not only on its physical characteristics but also on the privileges, social regulations and responsibilities that accompany its ownership (Pearse, 1993). More precisely, tenure arrangements, through the imposition of regulations and the creation of incentives affect the amount of economic rent that a resource can generate, influence the ways in which firms behave and determine how forests are managed (Pearse, 1993; Haley and Luckert, 1990). Property rights govern the efficiency of resource use throughout an economy, as well as the income distribution (Pearse, 1990). The following assessment uses the taxonomy of characteristics or dimensions suggested by Scott and Johnson (1983), expanded by Haley and Luckert (1990) and further supplemented in this paper. These characteristics represent potential variables of policy tools and include comprehensiveness/exclusiveness, transferability, duration, use restrictions, size specifications, operational requirements, operational control system, charges and fees paid to the Government, and security.

2.2.1.1 Comprehensiveness and exclusiveness

Comprehensiveness and exclusiveness are two integrated components of property rights. They both define the level of control a right holder has over a given asset. Comprehensiveness refers to what is included in the rights. That is, the extent to which

the holder's rights extend to all attributes of the resource (Pearse, 1998). In the case of a logging concession, comprehensiveness is related to the number of attributes of the forest over which the concessionaire has control. The question of a suitable level of comprehensiveness in a forest concession is complex. A key source of complexity in setting the level of comprehensiveness in forests is the non-market nature of some values arising from the forest. Providing logging firms with property rights over all the forest attributes may not lead to optimal use of products with no market value, because firms may not have incentives to produce them in socially desirable quantities and qualities, and to manage them properly (Haley and Luckert, 1990). Also, too much comprehensiveness may lead to loss of specialization. On the other hand, limited comprehensiveness to forest resources may prevent integrated multiple use management that may be required for sustainability in the forest. As to exclusiveness, it can be defined as the right of a tenure holder to exclude other individuals from the benefits of an asset. Degrees of exclusiveness can vary from open access, common property, state property, and individual exclusivity. For a firm, exclusiveness is required for transactions (i.e. for the transfer of products).

2.2.1.2 Transferability

Transferability measures the degree to which the tenure holder can transfer rights, or products derived from rights, to someone else, as circumstances change (Pearse, 1998). It refers to a holder's ability to sell, lease, give or bequeath the rights to whom s/he wishes (Haley and Luckert, 1990). The literature suggests that transferability of property rights is essential in promoting the efficient use of resource (Pearse, 1976; Scott, 1984; Haley and Luckert, 1990). That is, transferability of property rights is said to allow markets to direct resources to their highest use and provide resource users with the opportunity to gain from comparative advantage, specialization, and economies of scale. Restrictions on transferability of property rights can have important effects on economic rent, private sector behavior and the achievement of policy objectives. For instance, incentives may exist to invest in regeneration if the

expected net present value is positive and there are no barriers, either market or administrative, to the sale of immature forests stands. Conversely, if there is no possibility of recouping one's costs before rotation age, by making profits during the transfer process or sale of the concession, then investing in silviculture amounts to freezing capital for the rotation period; that is for 30 to 40 years. It is doubtful that a rational firm will voluntarily undertake such an investment. Yet, minimum limitations to transferability may be necessary to prevent the concentration of resources within the hands of few companies and the creation of monopolies that could result in socially inefficient forms of development (Haley and Luckert 1990, Young 1992).

2.2.1. 3 Duration

Duration refers to the period over which property rights can be exercised. In considering tenure duration, renewability is an important aspect to be taken into account, as it can affect the ultimate tenure duration (Haley and Luckert, 1990). Pearse (1985, 1993) mentions that the duration of tenure is important in forestry because the full impacts of forest activities are felt over long periods. Tenures, from a private investment perspective, should be sufficient in duration to ensure that tenure holders can realize the future benefits and costs that flow from their actions. Tenures that do not convey long-term rights over a concession may undermine the loggers' incentive to invest in future forest production, especially in the case of natural regeneration because the benefits may not accrue before the end of the tenure. Furthermore, if firms plan their activities over unlimited time horizons, then any external curtailment may distort their business plans. Haley and Luckert (1990) note that long term tenures may be advantageous for private investments but, by locking up forest uses for long periods, they leave the government with less flexibility to make changes in case of changing social needs.

2.2.1.4 Use restrictions

Use restrictions are provisions that limit the ways that an asset may be used. Many governments use zoning regulations to set use restrictions. Use restrictions aim at ensuring that only compatible forest uses are combined in a stand, therefore avoiding interference from possible negative externalities arising from incompatible uses or activities. Use restrictions can create the same problems as restrictions on transferability (Luckert and Haley, 1990). Restrictions on the possible uses of an asset reduce the tenure holder's ability to respond to market signals and capture more economic benefits by moving the resource to a more valuable use.

2.2.1.5 Size specifications

Size specifications refers to restrictions on the area or the volume which may be granted under a given tenure arrangement, or the size of the firm to which a concession may be granted. If property rights are transferable in a free market, there may be a tendency for tenures to adjust in size to a point where private economies of scales can be realized (Haley and Luckert, 1990). Size restrictions may limit the growth of efficient firms, while firms that increase in size are more able to achieve specialization and with increased scale of production, obtain more unit of output per unit of input, hence growth (Norton and Alwang, 1993). On the other hand, larger tenure may result in the creation of local monopolies and increase market imperfection so that costs to society may be greater than the benefits of realizing economies of scales.

2.2.1.6 Operational requirements

Operational requirements are obligations that firms must meet as part of the tenure agreements. Operational requirements include harvesting, regeneration and processing requirements (Luckert and Haley, 1990). The harvesting requirements and guidelines are usually designed in an attempt to achieve full utilization of the timber resource, sustain timber flows, and protect non-timber resources from the potentially damaging impact of some harvesting practices. Pearse (1993) suggests that harvesting is the most

important part of resource management because the manner of harvesting affects the productivity of the stock and its capacity to rejuvenate, and often impact habitats as well. In the context of sustained yield policies, regeneration requirements in a logging concession aim primarily at maintaining the annual allowable cut (AAC), although they may also contribute to the development of non-timber values. The objective behind processing policies is also similar to AAC policies in that they attempt to develop and sustain local economies by ensuring that some degree of value added will occur within the logging area (Luckert, 1997).

2.2.1.7 Operational control system

Operational control is the means by which the government ensures the monitoring of forest management and the other requirements attached to the concessions (Haley and Luckert, 1990). The effectiveness of operational control depends on the adequacy of the monitoring system and the penalties. But, operational controls impose monitoring and enforcement costs on both the government and the concessionaire. Such costs of regulations may be expensive and bureaucracy-intensive, often inefficient, and frequently inequitable (Cook, 1998).

2.2.1.8 Charges and fees paid to the government

This tenure characteristic refers to all payments made by firms to the government, excluding the normal corporate tax that does not depend on the concession's conditions. Most of the charges and fees paid to the government aim at capturing the economic rent in the timber industry. They are used to ensure that the resource's owners (i.e. the country's citizens) obtain value from their resources. Given that forestry charges affect the profits of firms, they may have important implications for efficiency in the way resources are allocated and used. They may influence the concessionaire's behavior, by encouraging efficient utilization, proper logging, and regeneration (Grut *et al.*, 1991). Conversely, rent collection systems can be used as incentives to discourage undesirable behavior from firms (Pearse, 1998). However, an

inappropriate rent collection policy might induce damage to the resource by encouraging over-harvesting (Leruth *et al.*, 1999)

2.2.1.9 Security

Security is an extremely important factor influencing firms' behavior. It conditions the impact of all the other tenure characteristics. In general, the time horizon of forest firms depends on the security of their property rights, and their normal business risks (Stanbury and Vertinsky, 1998). Security is a function of the property rights holders' perception. It is related to the extent to which they trust the political system in their country of operation, past experience and the probability they attach to the chances of political or social changes of various types. "Specifically, security depends on the chances the tenure holders attach to the renewal or replacement of their property rights when their term expires; the probability of tenure agreements being modified adversely during their term or at their expiration or renewable date; and the probability of rights being expropriated without adequate compensation" (Haley and Luckert, 1990). Insecurity reduces incentives for long run investment such as silvicultural operations as well as investment in processing plants. A private firm will hardly undertake a long run investment voluntarily if there is a large probability that its rights may be discontinued or harmfully modified at any time. In contrast, security may be a sustainability guarantee as "investors perceive that, if they continue to use the resource sustainably, their heirs, assigns and successors will be entitled to use that resource in perpetuity" (Young, 1992).

2.2.2 Indicators of policy efficiency, equity, and environmental soundness

The following sections present some indicators commonly used to assess policy performance and discusses their relevance and applicability in the case of this study. The indicators discussed include: the amount of rent generated by the sector, and the sector contribution to GNP for policy efficiency; the sector contribution to the human poverty index (HPI) for intra-generational equity; the adjusted national net product

(ANNP), and the genuine savings rates for intergenerational equity; and the ecological resilience for environmental soundness. The actual indicators, or proxies, used to assess the new policy are presented in Chapter 6.

2.2.2.1 Indicators of policy efficiency

At the aggregate level, the efficiency of a sector policy may be measured through the contribution of the concerned sector to the country's economic growth. The contribution of a sector to the economic growth of a country, in turn, can be measured in many ways including, the sector contribution to the Gross National Product (GNP). GNP captures the growth in output and is computed as " the total domestic and foreign output claimed by residents of a country" (Todaro, 1977). GNP and related measures are the conventional macro-economic measures of economic development. Development institutions, including the World Bank and the International Monetary Fund, also base their intervention strategy on that indicator. But, GNP is primarily a measure of economic growth based largely on market transactions. It does not capture non-market values and externalities. In the case of Cameroon, using the sector contribution to GNP may not reflect the exact situation because the full socio-economic contribution of forests may be undervalued by the fact that sector contribution to subsistence in the rural areas and non-market values are not taken into consideration. Despite this limitation, and in the absence of another ideal indicator, a variation of GNP is used in the analysis of sector performance presented in Chapter 6.

At the sector level, some natural resource economists perceive economic rent as the most appropriate measure of the contribution of natural resources to economic welfare (Gunton and Richards, 1987). That means, the achievement of welfare improvement in the forestry sector is conditional upon policy instruments that can lead to rent maximization. Economic rent can be defined as the surplus remaining after revenues from natural resources exploitation have been disbursed to pay all the production costs, and a normal profit (Gunton and Richards, 1987). It is measured as the

difference between the market price of the resource and the full marginal costs of its harvest, including normal returns to capital (Atkinson *et al*, 1997). In practice, the identification of forest economic rent is a complex process. Complexity arises from the very many factors to be taken into consideration in the rent identification process. One source of complexity is that in the calculation of rent, we have to consider both mature trees and future crops, with the value of future crops depending on current harvesting practices and silvicultural investments. In other words, forests are both the product to be harvested and the factory that produces the wood to be harvested in the future (Luckert, 1999). Accordingly, the economic rent in timber harvesting is made up of two sources of value. The value of mature stocks may be referred to as a " stock rent" while the potential of a forest to produce future timber crops after mature trees have been harvested may be referred to as a "land productivity rent" (Luckert and Bernard, 1993).

The evaluation of economic rent also depends on the rent collection system. The usual way to collect economic rent from logging activities is with fees. However, governments may choose to pursue social objectives by collecting social rents through specific dimensions of property rights, instead of, or in addition to, collecting economic rent with fees. For example, a government may choose to require companies to create more jobs than they would if their decisions were based purely on profit maximization. These restrictions increase the costs of the tenure holders and reduce the amount of economic rent available for collection through forestry fees. But it is difficult to determine if the costs of achieving social objectives, in terms of forgone revenues, are outweighed by the generated social benefits from restrictions. In this study, the term economic rent refers only to timber rent produced by and collected from the timber industry, given that rights to non-timber products are not transferred to logging companies.

2.2.2.2 Indicators of policy equity

It is difficult to define a satisfactory indicator of equity or distribution of social welfare, either cross-sectionally, or inter-temporally. In this section, we present the commonly used indicators for both intra-generational and intergenerational equity.

The human poverty index (HPI) is commonly used to assess the sector contribution to social welfare and its intra-generational distribution in developing countries. The HPI concentrates on deprivations in the three essential aspects of human life. In constructing the HPI, the deprivation in longevity is represented by the percentage of people not expected to survive to age 40, and the deprivation in knowledge by the percentage of adults who are illiterate. The deprivation in a living standard in terms of overall economic provisioning is represented by a composite of three variables: the percentage of people without access to safe water, the percentage of people without access to health services, and the percentage of moderately or severely underweight children under five (UNDP, 1998). The HPI has been completed in Cameroon for the duration of the study but the contribution of the forestry sector to the index is not known. Consequently, the HPI is not used in this study.

Two indicators of intra-generational equity are considered in this section. The idea underlying these two indicators is that, if enough is saved each year to cover the depreciation of both man-made and natural capital, the economy can sustain its level of consumption. Gillis *et al.,* (1996) suggest that the adjusted national net product (ANNP) is an appropriate measure of non–declining growth. ANNP is computed as GNP minus consumption of made capital and depletion of natural capital. To the author's knowledge, the ANNP has not been computed for Cameroon and cannot consequently be used in this study. The genuine savings rate is computed as the net savings less the value of natural resource depletion and degradation (Atkinson *et al.*, 1997). It aims at estimating the level of output that is not consumed and is therefore available for transfer to future generations. Negative genuine savings show that the

situation with regard to future well-being is worse than it might otherwise be thought. The genuine savings rate available for Cameroon is aggregate ones that include all sectors. Because there is no data on the specific case of the forestry sector this measure is not used in this study.

2.2.2.3 Indicators of environmental soundness

Measuring ecological sustainability is not an easy task. Various indicators have been suggested. In the forestry sector two concepts have been introduced: the ecological resilience of the ecosystem presented by Atkinson *et al.* (1997), and the rate of biodiversity loss recalled by Pearce and Atkinson (1995). Ecological resilience is open to interpretation due to difficulties in collecting data on changes in ecosystem that are required for its computation. As to losses in biodiversity, estimates of precise rates are hampered by the absence of baseline measurement in Cameroon. Consequently, neither of the two ideal indicators of environment soundness is available for this study.

CHAPTER 3: ECONOMIC IMPORTANCE OF FORESTS IN CAMEROON

As with most developing countries, Cameroon still counts on its natural resources to boost the development of its economy and to satisfy the basic needs of its population, especially in rural areas. Since the decline of oil production, timber has become the major export commodity of Cameroon and due to the large quantities handled, it contributes significantly to other sectors of the economy, mainly transport. This chapter presents the main features of the forestry sector in Cameroon. It includes a brief overview of the importance of the sector and provides insights into the reasons for changes in policy over the period of the study. Cameroon's forest resources are briefly described, and the main sector players, including the forest operators and the forestry administration, are presented.

3.1 Forest coverage.

Cameroon is located on the western coast of Central Africa, just north of the equator. Cameroon shares borders with Nigeria to the west, Equatorial Guinea, Gabon and Congo to the south, Central African Republic to the east, and Chad to the north. The population of Cameroon is about 14.7 million, 53 per cent of which live in rural areas. Forests account for 22.5 million ha; that is more than 40 per cent of the country's land base. Cameroon's forests can be categorized into three types: drained land (17.5 million ha), degraded forests (4.5 million ha), and swampy forests (0.5 million ha) (Eba'a Aty, 2000). Most of Cameroon's forest is in the southern part of the country, south of the 6^0 $30'$ north latitude, and is part of the rich rain-tropical forest of the Congo Basin (see Cameroon map in figure 3.1).

To take advantage of this asset, the Government has adopted a zoning plan for southern Cameroon that aims at perpetuating the different functions of the forest in separate blocks, over time. The zoning plan fixes the geographical distribution of permanent and non-permanent forests, with permanent forests representing 30 per cent

of the country's area (Decree N0 95-678, 1995). Non-permanent forests include areas that may be converted to non-forestland. They are devoted to multiple uses including agriculture, short-term logging and community forestry (Forestry Law 1994; Decree N0 95-678, 1995). The dominant uses for permanent forests include ecological reserves, forest reserves, national parks, recreation forests, and research areas. The permanent forest devoted to continuous timber production is part of forest reserves and covers about six million hectares. It has been divided into logging concessions in which forest management agreements with specific operational requirements are to be implemented. Four million hectares have been set aside as statutory protected areas for conservation purposes. Figure 3.1 provides an overview of forest coverage, and forest eco-regions of Cameroon. Table 3.1 presents the distribution of the 14 million ha zoned in different uses.

Figure 3.1 Distribution of Cameroon Forests (Source: WWF Cameroon)

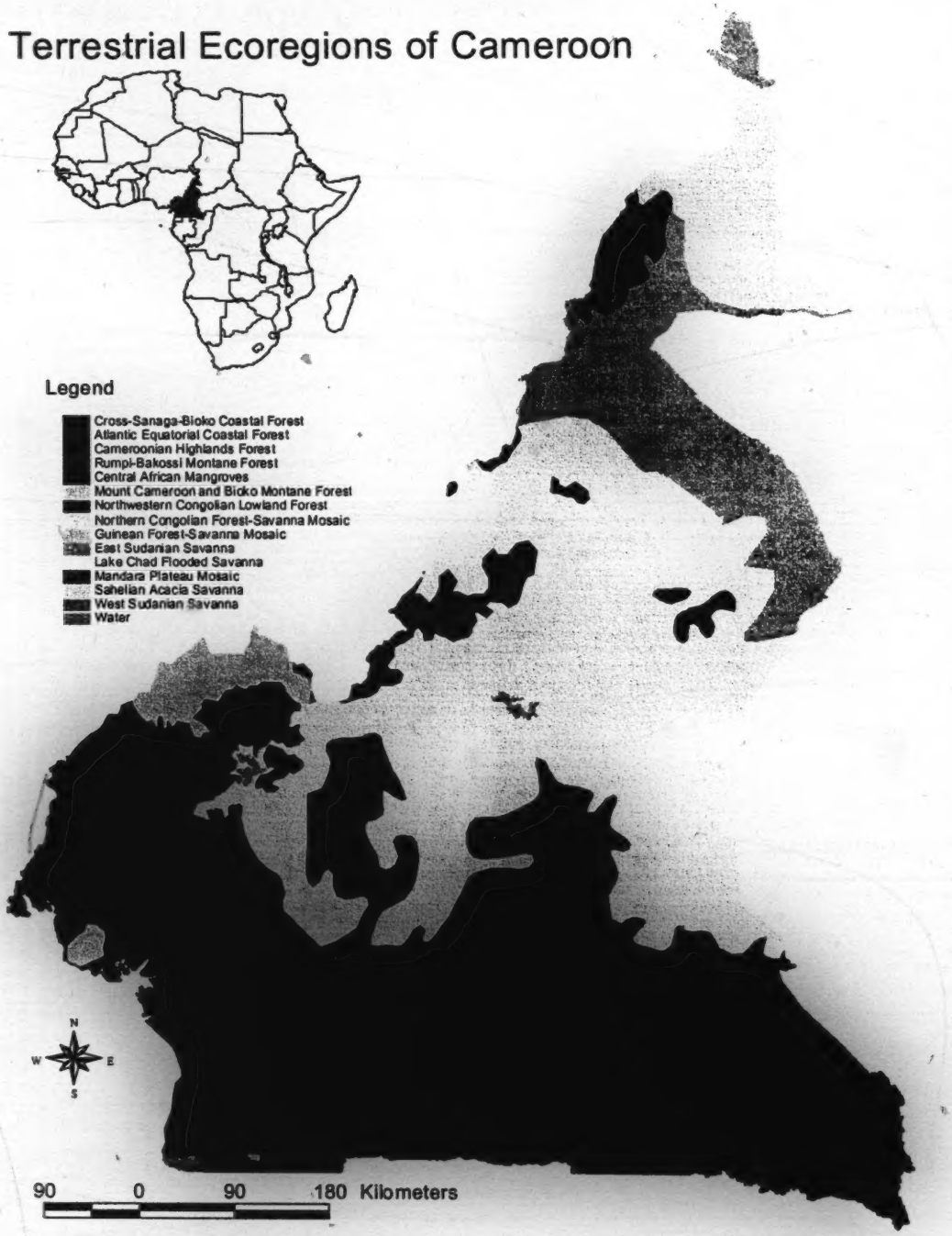

TABLE 3.1 DISTRIBUTION OF THE AREA ZONED IN DIFFERENT USES

Primary Forest objective	Forest category	Land coverage (million ha)
Logging concessions	Permanent	6
Protected areas	Permanent	4
Community forests	Non permanent	4
Agro-forestry and others	Non permanent	
Total area under zoning	All categories	14

(Source: adapted from Decree N0 95-678, 1995)

3.2 Forest content

The forests of Cameroon contain more than 300 distinct species of trees and a diverse wildlife population (MINEF, 1993). Out of the 300 tree species found in Cameroon forests, only 80 are harvested by the timber industry. The estimated inventory of mature stock in the permanent productive forest is about 110.6 million cubic meters for the 20 currently most marketed species and up to 196 million cubic meters for a larger list of 59 marketed species (Karsenty *et al.*, 2000). Non-timber forest products (NFTPs) like bush-meat, edible roots, fruits and leaves, play an important role in rural subsistence economies. Global Forest Watch (2000) estimates the annual consumption of bush-meat, at the country level, at about 2.5 kilograms per capita. The NTFPs that are being commercialized also provide substantial revenues for forest dwellers. Women in particular generate a substantial part of household income through the use and trade of NTFPs (Meijerink, 1995). Fuel-wood and charcoal are the main sources of energy for rural communities and for poor city dwellers.

3.3 Forest operators

In Cameroon, property rights on forests are vested in the State and the Government acts as the only landowner, on behalf of the population. The naturally forested lands are under public ownership. However, the Government may grant rights to individuals

or groups, to use forests and forest products. For instance, customary rights are guaranteed to local communities. The Government also transfers timber-harvesting rights to the private sector under various types of tenure. The pattern of forest tenure over the period of the study reflects the evolution of the forest policy.

Cameroon forests have historically been harvested by European parent groups including wholly financed French assets, and some Italian assets (see list of predominant firms in Appendix 1). This predominance of European companies has been altered since the early nineties, with the arrival of Asian entrepreneurs in search of timber to supply their firms, following the banning of log exports in most of the Asian timber producing countries. A few local entrepreneurs also operate in the sector. Processing units in Cameroon range from simple saw-milling to the integrated production of plywood and veneers. Saw-milling is the dominant form of wood processing, and most of the production is exported. The domestic market for timber is small and mainly supplied by holders of small timber permits and small chain-saw operators who operate illegally.

3.4 Forestry institutions

The forestry administration was part of the Ministry of Agriculture until 1992. Consequently, the Forestry Department did not have enough space and positions. It was composed of four units responsible for issuing and administration of harvesting contracts, promotion of local industry, planning inventories, and inspection. Due to the limited number of positions at the center, most of the staff members with sufficient expertise were assigned to field positions. However, with expansion of the timber business, and the increasing pressure from conservationist groups towards sustainable forest management, the size and the structure of the forestry administration became increasingly inadequate. An institutional assessment completed in the late 1980's as part of the sector economic review led to the creation of a Ministry in charge of forests in 1992. Almost all the units of the former Forestry Department in the Ministry of

Agriculture became larger departments. The Department of Wildlife and Protected Areas formerly with the Ministry of Tourism was also brought under the new Ministry of Forests. Forest management in productive forest and the timber industry fall respectively within the realm of the Forestry Department and the Department of Timber Industry, in the headquarters and their decentralized services in the regions.

For reasons partially related to the overall adjustment of salary expenses in the public service, the creation of the Ministry in charge of forests was not accompanied by a recruitment of staff. In an institutional audit completed recently, Pousse (2001) reported that there are still many vacancies to be filled[2] within the Ministry. Pousse also suggested that, unlike under the old policy regime, the distribution of tasks between the headquarters and the regions is not rationalized. Most of the supervision tasks are now centralized. The monitoring, and control tasks that should be carried out by regional staff members have not been clearly defined. The two components of the forestry administration seem to work in isolation, with little information exchange between the two units. This new orientation is demonstrated in the number of regional staff members assigned to the actual fieldwork, that is, to monitoring and control. The following table provides an overview of the current capacity of the forestry administration to monitor field activities in the main timber producing regions:

TABLE 3.2 MONITORING CAPACITY FOR LOGGING CONCESSIONS IN 1999.

Timber producing regions	Forest coverage (ha)	Area under forest concessions (ha)	Number of staff assigned to the region	Number of staff assigned to daily field tasks	Capacity in monitoring field activities (ha/per.)
Centre	1 369 235	238 060	395	67	3 500
South	4 733 775	1 740 438	115	21	83 000
East	7 423 188	4 058 746	116	23	176 000
Total	13 526 198	6 037 244	626	111	N.A

(Source: adapted from Pousse, 2001)

[2] Pousse (2001) reported that there are 99 positions to be filled within the Ministry of forests, all departments included; 49 at the center, and 50 in the regions.

In addition to organizational and staffing problems, the newness of the sustainable forest management (SFM) concept seems to be a problem for the forestry administration whose staff skills match better with the old sustained yield doctrine. As we will discuss later in this study, these institutional weaknesses of the new forestry administration may have affected the results achieved in the policy objectives.

CHAPTER 4: BACKGROUND OF THE OLD POLICY

This chapter provides background information on the context in which the objectives for the forestry sector were adopted in the 1970's and the 1980's. It recalls the main components of the old policy objectives and presents the property rights set up adopted at that time to achieve these objectives.

4.1 Key objectives of the old policy

Until the early 1990's, the Government of Cameroon did not have a formal forest policy per se. The policy goal and specific objectives were announced every five years in a chapter devoted to forests within the national development plan. In the 1970's and 1980's, the Government goal for the forestry sector was to produce timber products for domestic use and international trade, and ensure a significant contribution of forest to the well being of rural people and the welfare of the entire nation. This goal was translated into objectives in the exposition of motives of the Forestry Law (1981). The two main objectives were to: develop an efficient timber industry, and ensure equitable distribution of forest benefits within the current population giving priority to rural areas.

4.1.1 Objective of developing an efficient industry

The objective of developing an efficient timber industry was defined by a number of more specific sub-objectives including: increasing log production, promoting in-country wood processing, increasing exports of timber products, and avoiding concentration. As we shall discuss in this section, these specific objectives were interrelated.

4.1.1.1 Increasing log production

The main policy objective related to logging was to use timber as an economic asset. Therefore, increasing the production level could increase the revenues collected by the Government for economic development purposes, and create more employment in the

rural areas. There was no planning of log production and the sector was managed on a demand basis, with timber companies defining the scale of activities. Neither was there any clear target in terms of quantities to be harvested or not to be exceeded. The lack of precision on the desirable production was partially due to the relatively limited importance of the timber business in terms of volume extracted, and revenues generated for the Government compared to the other sources of income, like oil.

4.1.1.2 Promoting in-country wood processing

The Government's objective in the area of wood processing was twofold. The first aspect was primarily related to the contribution to the country's economic growth. It aimed at creating more value added in order to increase the value of timber exported towards the improvement of the gross national product (GNP) and the balance of payments. The second aspect was more socially driven. It aimed at promoting a local industry to boost economic development in rural areas through hubs of development accompanied by the improvement of local demand for food crops, industrialized products, and facilitating transportation of export crops and agricultural inputs.

4.1.1.3 Increasing exports of timber products

The objective here was to promote exports and generate the funds and currencies needed for the purchase of foreign machinery and other imported goods. It also sought to improve the balance of payments.

4.1.1.4 Avoiding concentration

Avoiding concentration was one of clearly stated objective pursued by the Government in the forestry sector. The underlying concerns were on both equity and efficiency considerations. On the equity side, the government wanted to ensure that national entrepreneurs could operate in the sector and that foreign companies did not dominate them. Regarding efficiency, the idea was to avoid the creation of monopolies.

4.1.2 Objective of ensuring an equitable distribution of forest benefits

Creation of local employment and improving living conditions in the rural areas was a major concern at the political level. In the 1980's, 69 per cent of Cameroon's population was still living in the rural areas (World Bank, 2000). For numerous rural communities, timber-harvesting activities were the only source of economic support. The Government's idea was to grant harvesting rights and promote the creation of local wood processing units that would improve the living standards of neighboring forest communities, by increasing the level of non-farm employment, and the average rural per capita income. To that end, requirements attached to harvesting contracts included the provision of basic socioeconomic infrastructures such as roads, health centers, water points and alternative modern sources of energy. The Government also sought stability in rural areas, to limit rural-to-urban migration of young people.

4.2. Tenure arrangements under the old policy

Tenure arrangements under the old policy were spelled out in a Forestry Law issued in 1981 and the subsequent decree. The tenure system consisted of various forms of leases, licenses, and permits that authorized their holder to harvest forests according to the contract terms. The relative importance of the tenure contracts, in terms of area coverage or timber production, over the entire decade would be difficult to determine, in the absence of reliable data. For the purpose of this study, we shall consider only licenses whose duration and area coverage were more significant and likely to affect the policy results.

4.2.1 Start up conditions: the system of allocation of licenses

Logging in Cameroon has always been open to foreign and national individuals or firms, who have registered beforehand in the forest administration books. Registration is an administrative procedure that establishes a list of individual firms eligible to practice logging in Cameroon. It is meant to recognize the professional skills of the beneficiaries in the area of activity in which they are authorized to practice.

Registration however does not guarantee that eligible individuals will be awarded harvesting rights[3]. An arbitration committee that includes representatives of the relevant government services and the forest industry handles both the registration and the allocation processes (Forestry Decree 1983, articles 23-25, 30-32). Under the old policy regime, timber licenses were granted on a "gré a gré" basis, without clear selection criteria. Before the final license contract was signed, the holder was required to organize a public forum with neighboring communities so that local people could express their concerns about their traditional rights to forests. The forum was also meant to promote neighborliness between the local communities and the logging firm. During these sessions, the communities were requested to express their needs for basic socio-economic infrastructures such as classrooms, health centers, water points, and roads. This infrastructure was directly provided to the concerned communities by the firm, in compensation for disruption to local use that might occur. The minutes of the forum were attached to the harvesting contract (Forestry Decree 1983, article 31). Since the adoption of the new law in 1994, communities have responsibility for planning and paying the infrastructure associated with harvesting rights, using a portion of the area tax transferred to them by the Government.

4.2.2 Comprehensiveness and exclusiveness

License holders had the exclusive rights to harvest timber within their licensed areas. (Forestry Law 1981, section 39). Limiting comprehensiveness was important under the former policy regime as the country, supposedly rich in natural minerals, had not located the actual important sites. The idea was that, the tenure holder left alone in the forest might exploit whatever resource was available, including minerals and ivory. Part of the control system was tailored to ensure that only timber was being harvested. In addition to granting separate mineral rights, the Government retained the right to grant permits for collection of non-timber products, such as rattan and medical plants,

[3] Out of 479 logging companies registered in 1998, about a hundred actually held harvesting rights (Global Forest watch, 2000)

to different individuals or firms. In addition, the neighboring communities maintained their traditional rights to trapping, fishing and collection of other NTFP (Forestry Law 1981, section 21; Forestry Decree 1983, article 34).

4.2.3 Transferability

Licenses were transferable, conditional upon the approval of the forestry administration (Forestry Law 1981, section 38). The main reasons for controlling the transfer of licenses were to locate the area harvested by individual companies, prevent monopolies and collect the transfer fee. Transferability of licenses was not really an issue for tenure holders under the old regime because of the limited tenure duration, and the possibility for firms to abandon a license and apply for another one. Few cases of transfer had occurred. Log exports were restricted by the requirement to process at least 60 per cent of the production domestically, coupled with an export fee on logs (Forestry Law 1981, section 43; Forestry Decree 1983, article 38). But, as we shall discuss later, the processing rate requirement was not really enforced. In contrast, export of processed woods did not suffer any transferability limitation because the Government's objective was to promote a domestic timber industry and export less raw logs.

4.2.4 Duration

Licenses were assigned for a renewable period of five years (Forestry Law 1981, section 28). The renewal was conditional upon Government approval, through an administrative procedure that theoretically aimed at ensuring that the tenure holder had complied with the terms of the initial harvesting contract. The renewal procedure included almost as many steps as the application for a new license; only the public forum with the forest neighboring communities was excluded (Forestry Decree 1983, article 44). Although renewal was almost certain, some firms preferred moving to a different area at the end of their tenure contract given that there were still enough new forest areas available for logging. Given the length of the renewal procedure, and because harvesting was very selective with a few species being collected, there was no

real incentive to renew a license, except for rich forests where the whole area could not be harvested within the mandatory five-year period.

4.2.5 Use restrictions

Licenses were devoted to timber harvesting. Non-compatible activities were prohibited, including clear-cutting, lighting fires, and grazing (Forestry Law 1981, section 22). Road building, and construction of temporary residential houses were conditional upon Government approval due to their potential impact on forest cover and wildlife habitat. The rationale for Government approval was to ensure that the infrastructure would cause little damage to the forest. In addition, Government's approval of construction plans was aimed at ensuring the non-permanence of the infrastructure to be created in the forest, and reducing encroachment into the forest. However, this aspect of the regulations was not really enforced and, as we will discuss later, large roads were built in the forest, causing huge damage to the ecosystem (Catinot, 1989; Grut *et al.*, 1991).

4.2.6 Size specifications

Under the old policy regime, timber production was not really planned. As a result, licenses location and size were not predetermined. The applicants suggested sizes of tenures. In practice, the processing requirements attached to the size of licenses determined the area requested by the firms. As mentioned latter in this study, the larger the license, the more value–adding the processing unit was supposed to be. However, the maximum forest area granted to a logger could not exceed 200,000 ha (Forestry Law 1981, section 24). Tenures ranged in size from 10,000 ha to 200,000 ha. In principle, small size licenses less than 25,000 ha were reserved for domestic loggers (Forestry Law 1981, section 29)

4.2.7 Operational requirements

Operational requirements included harvesting and processing requirements. There were no conservation or management requirements per se. Regeneration was the responsibility of the Government, conceded to a specialized public agency. Regeneration operations consisted of tree plantations outside the logging area. It was assumed that the licenses area disturbed by logging activities would regenerate naturally if left alone. However, tenure holders had to pay a regeneration fee to finance the public agency work program (Forestry Law 1981, section 31). Harvesting requirements essentially consisted of minimum harvestable diameters per species, and a list of species of which harvesting was prohibited. Processing requirements varied depending on the size of the tenure; the larger the license, the higher the level of machinery required. Processing requirements did not apply to areas smaller than 10,000 ha. From 10,000 ha to 75,000 ha, the holder had to build a sawmill with two band saws, one with a passage of at least 1.40 m. For an area of 75,000 ha to 130,000 ha, the holder had to build a sawmill with two band saws, one with a passage of at least 1.60 m. For an area of 130,000 to 175,000 ha, the holder was required to operate a sawmill with two head saws, one with a passage of at least 1.80 m. For an area of 175,000 to 200,000 ha, the holder was required to operate a veneer or a plywood plant and a sawmill with two band saws, one with a passage of at least 1.60 m (Forestry Decree 1983, article 38; Schmidthussen, 1979). As Collardet (1976) mentions, veneer and plywood industries were perceived to economize in raw material and to add more value to timber than sawing. As we will discuss later, these requirements did not result in the creation of many plywood plants in Cameroon, because few companies applied for licenses above 175,000 ha. In addition, the Government emphasized more the installation of a processing capacity equivalent to 60 per cent of the firm's expected logging production. There was no strict follow up on the ratio of timber cut to the volume at mill gate. This partially explains why the objective of processing 60 per cent of log production domestically was never achieved.

4.2.8 Operation control system

The operational control system for logging licenses was relatively decentralized under the old policy. Many staff members were assigned to the field to monitor and control logging activities. Three main requirements were imposed on tenure holders. The license holder was responsible for conducting pre-harvest inventory for Government approval. An annual harvesting plan was required at the beginning of every fiscal year with indications of species and volume to be harvested. A post harvest report was submitted prior to any renewal or change of license (Forestry Law 1981, section 21; Forestry Decree 1983, articles 66 and 67). Monitoring and control were the responsibility of field staff while those from the headquarters were in charge of planning. The main monitoring and control instruments included i) a field book kept by the firms recording the number and volume of trees felled daily, the species, and the place of harvest; ii) waybills for transportation of timber products; iii) mill entry and exit books. Field staff were encouraged to declare cases of non-compliance with the tenure stipulations. They received an incentive bonus to that end (Forestry Law 1981, section 138). Many infractions were reported, especially logging beyond license boundaries. Although some rules were enforced, others related to the local processing rate and the adequate location of infrastructure were neglected.

4.2.9 Charges and fees paid to the Government

License holders were required to pay forest fees to the Government, including an area-based fee, a regeneration fee, a stumpage fee and export fee on logs. A portion of the amount collected was redistributed through the budget to the country population including those living in non-forested regions. A relatively smaller share was reinvested in forest development operations such as the national inventory, and tree plantations (Forestry Law 1981, section 32). Forest fees were determined on an administrative basis, with no connection with the market values of species. The stumpage fees and log export fees were differentiated between regions, taking into account the distance from the logging sites to the closest loading port. Differentiation

of fees aimed at encouraging logging firms to operate in the countryside and represented a compensation for higher transport costs. The annual financial law at the beginning of every fiscal year announced the value of forest fees, but these values remained almost constant over the whole decade. Forest fees in Cameroon were reported to be very low under the old policy regime (Grut *et al.*, 1991), because their level was not important for the Government, which relied more on oil revenues in the 1980's for its development expenses. Forests were seen more important for rural development, and foreign currencies gained in the trade of forest products. The lack of competition for timber-harvesting rights combined with the low and administered forest fees were likely to yield low returns to the Government, and lead to low timber utilization (Catinot, 1989, Grut *et al.*, 1991).

4.2.10 Security

Although the socio-political environment in Cameroon was very stable under the old policy regime, there was a risk that the Government could change the tenure size, prohibit the harvest of some species, or simply cancel the tenure at any time, for reasons of public interest. Another possible reason for cancellation was the violation of the tenure stipulations by the tenure holder. However, given the limited duration of harvesting licenses and the possibility to obtain a different license at almost no cost, the risk faced by firms was manageable. The available documentation does not mention cases of firm ceasing activity for security reasons, though the risk of cancellation at any time may have affected firms' management and investment decisions. However, there have been cases of interruption of activity due to conflicts between the firm and the neighboring forest communities.

CHAPTER 5: BACKGROUND OF THE NEW POLICY

This chapter provides background information on the new forest policy. It describes the context in which the new policy was adopted. It presents an overview of objectives pursued by the new policy, followed by a presentation of the property rights set up adopted supposedly to facilitate the achievement of these objectives.

5.1 Key objectives of the new policy

The new policy shares common objectives with the old policy and adds some new ones. These additions were dictated by the context in which the new policy was adopted. The context was marked at the international level by the Earth Summit in Rio de Janeiro in 1992 and the globalization of economic activity, and at the national level, by lessons from the sector economic review (Catinot, 1989), and a better knowledge of the forest potential. The Earth summit that took place in Rio de Janeiro in 1992 emphasized the common good characteristics of forests and the need for their sustainable management. It triggered keen interest in environmentally friendly practices from forest policy makers. At the same time, the globalization of economic activity had led to increased international flows of investment. Globalization was manifested in the forestry sector in Cameroon by the arrival of Asian logging companies in search of raw material following the banning of log exports in the usual supplying countries in South-East Asia. At the national level, the forestry administration had just completed a zoning plan for two-thirds of its forest area. The sector review undertaken in preparation of the national forestry action plan (NFAP) had revealed several weaknesses in the forestry sector. In addition, the Government was already receiving warning signals about the depletion of oil resources. Combined, these events changed the Government's attitude toward resource use. As mentioned earlier in this study, the Government's objectives in productive forests include (i) promotion of reduced impact logging in concessions, (ii) development of an efficient timber industry and increase sector contribution to economic growth, (iii) ensuring equitable distribution of forest benefits between and among generations.

5.1.1 Promote reduced impact logging in concessions

Following the alarming conclusions of the sector review related to the impact of extensive selective logging on the forest resource base, the Government decided to promote reduced impact logging and stabilize forest harvesting. Boscolo and Vincent (2000) recall that, in tropical forest, the two critical elements that characterize reduced impact logging are forest mapping and planning of roads, skid trails, and felling direction. The government objective was to encourage the adoption of practices that are ecologically sound and allow for the maintenance of forest ecosystem's integrity, productivity, resilience, and biodiversity. These practices were expected to result in the maintenance of chemical balance of soil, protection of watershed and streams, and the preservation of wildlife habitat.

5.1.2. Develop an efficient timber industry and increase the sector contribution to economic growth

5.1.2.1 Increase log production up to the sustainable harvest level

The forest inventories which preceded the adoption of the zoning plan in the early nineties revealed that Cameroon could produce up to four million cubic meters of logs annually without reducing the forest capacity to reproduce. This information was turned into an objective by the sector policy makers towards the overall goal of increasing the sector contribution in economic development.

5.1.2.2 Improve mill input to wood output ratio in timber processing

This specific objective was set to correct the huge waste reported in wood processing (Grut *et al.*, 1991). Untill the late eighties, high volumes of logs were required to produce processed wood. The Government thought it could correct the situation by setting specific processing requirements.

5.1.2.3 Increase value added in the forestry sector

The relatively poor contribution of the forestry sector to GDP until the early 1990's has been perceived by the Government as a result of insufficient industrialization in the forestry sector. In addition, the public has been concerned about booming log exports, especially as many other timber-producing countries were reported to have stopped exporting logs. Consequently, promoting a high value-adding timber industry was seen as the most important policy objective in Cameroon, and its was perceived as a tool to reduce extensive selective logging. The predominance of that objective is translated in the new forestry policy by the announcement of a log export ban to become effective anytime after year 2000 (MINEF, 1993; Forestry Law 1994).

5.1.2.4 Maximize the amount of rent collected through fees

Another government objective referred to was to maximize the amount of rent collected through forest fees and redistribute it to all country citizens through the budget system. The concern is to ensure that the Government, as a resource owner acting on behalf of the general public, collects maximum rent from the sector. Two tools were adapted to that end, including a competitive bidding process for tenure allocation, and the adoption of fees based on the market price of timber species. The bidding process was supposed to introduce transparency in the allocation process and increase the level of rent collected. As we will discuss later in this study, the objective of increasing the amount of rent collected through fees may come in conflict with some social objectives such as the creation of employment that translate into an *ex-ante* collection of social rents.

5.1.2.5 Increase exports of timber products and gain foreign currencies in trade

As with many developing countries, exports have been seen in Cameroon as essential in the search for foreign currencies towards the improvement of the balance of payments. Increasing the quantities and values of timber products exported was therefore a specific sector objective.

5.1.2.6 Avoiding concentration in the sector

The political reasons that led to the adoption of measures against concentration of harvesting rights under the old forest policy were also used under the new policy regime. The argument is that the government of Cameroon should seek to avoid the creation of monopolies and control of timber rights allocated to foreign companies, in order to maintain opportunities for local entrepreneurs.

5.1.3 Ensure equitable distribution of forest benefits among and between generations

5.1.3.1 Intra-generational distribution of forest benefits

Finding effective ways to improve living conditions in the rural areas has always been a Government concern. Despite a huge rural-to-urban migration[4], a significant proportion of Cameroon's population still resides in areas where timber management activities (logging and/or timber processing) are the dominant source of paid jobs, and usually the only source of economic wealth. Policy makers in the sector believe that developing a stable wood products industry will contribute to stability in regional employment incomes, and contribute to political systems. But as we shall discuss later in this study, the potential of logging to secure employment over time is limited (Dellert, 1998; Wear and Hyde, 1992).

5.1.3.2 Sustain production of forest products and services over time

The sustained yield approach was adopted to attempt to perpetuate the benefits from logging over time. It was assumed that, with an AAC and a minimum rotation period requirement, the product of forest growth would be harvested on a sustainable basis. Moreover, increasing the number of species to be harvested would supposedly reduce

pressure on the most valuable ones and silvicultural operations would enhance the forest texture after harvesting. In addition, specific harvesting requirements controlled logging in ecologically sensitive areas, and wildlife habitats were managed to protect biodiversity. These tools were combined to attempt to ensure the perpetuation of timber resources and other forest products over time.

5.2 Tenure arrangements under the new policy

The above new policy objectives were operationalized by changing tenure characteristics in many ways.

5.2.1 Start Up Conditions

Before a concessionaire begins harvesting, s/he must first be awarded a concession and successfully fulfill the conditions of a probationary period. The concession allocation mechanism is based on a public bidding system. The system was chosen as a tool to bring in transparency, foster competition, and introduce the use of market-based instruments into the timber industry (MINEF, 1993). Bidding is open to foreign and national individuals or firms, who have registered beforehand in the forest administration books. A commission that includes representatives of the relevant Government services and the forest industry handles the bidding process.

Concessions are awarded in a two-tier procedure. The first step, a pre-selection process, is based on technical criteria related to the ability of firms to manage a forest and operate a processing plant. Criteria include the type of processing plant owned or operated by the candidate and the amount of employment generated by the firm. The greater the amount of value-added, and the higher the number of employees projected, the higher the chance for the firm to be pre-selected. In the second step, firms who have passed the pre-selection step, bid for harvesting rights on a per hectare basis

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[4] According to the World Bank (1999), 45 per cent of Cameroon's population lived in urban areas in 1999, compared to 31 per cent in 1980.

(Forestry Decree 1995, articles 63 to 65). The bid price is important in the process as the amounts offered are supposed to capture the loggers' willingness to pay for a particular concession, given their knowledge of timber FOB prices and the content of the forest. The Financial Law sets an upset bid price annually. The amount that the winner is willing to pay per ha for a particular concession becomes the annual rate of area tax for that concession over time. The bid price is part of the rent collection system but does not include the stumpage fees that are paid on a cubic meter basis, as trees are harvested. Following the spirit of the Government policy, the bid price is directed at capturing a share of economic rent up front.

The concession winner is granted a three-year probationary contract to fulfill some preliminary requirements (Forestry Decree 1995, articles 66 and 67). The requirements to be met are (i) completion of a management inventory, (ii) preparation of a draft management plan, (iii) adoption of a five year operational program, and (iv) the installation of, or a signed agreement with, a processing plant. In addition, the concessionaire is required to organize a public forum with neighboring communities so that local people can express their concerns about their traditional rights to forests. During these sessions, the communities are requested to express their needs of basic socio-economic infrastructure that the company could provide, in compensation for disruption to their usual use of forest resources. A portion of the area tax transferred by the Government to local communities finances the infrastructure. After satisfactory completion of the probationary period, the concessionaire is granted an actual harvesting contract. The length of the probationary contract is not included in the duration of the actual concession. Non-compliance with the terms of the probationary contract may lead to the cancellation of the concession allocation, and the concession is taken back to the market (Forestry Decree 1995, article 68).

5.2.2 Comprehensiveness and exclusiveness

The new Forestry Law provides the concessionaire with the right to harvest a specific amount of wood from the concession area to supply a processing plant with timber in

the long run (Forestry Law 1994, section 46). The right to harvest trees cannot be granted to more than one holder in the same concession (Forestry Decree 1983, articles 61 and 69). Therefore, the concessionaire holds an exclusive harvesting right. However, the Law allows for divided ownership of a concession. Several individuals can own distinct attributes of the same forest, each individual owning alone some subset of attributes. For instance, permit holders may be allowed to harvest non-timber products within a timber harvesting concession area. Neighboring populations also maintain their traditional rights within logging concessions. Traditional rights include hunting by trapping, fishing, collection of dead fuel wood and other non-timber products (Forestry Decree 1995, article 61; MINEF, 1998). The exploitation of non-timber products by local communities is underlined by an agreement with the concessionaire concluded during the hearing sessions, prior to the beginning of logging activities. The Forestry Law is not specific about the recreational activities in concessions although the literature suggests that there are benefits in integrating such activities with tree harvesting. There are also no provisions on the logger's rights to future crops that may result from silvicultural investments.

5.2.3 Transferability

In Cameroon, as in most of the timber producing countries, one of the reasons for control on concession transfer by governments is to avoid the concentration of all the resources in the hands of a few firms. In the particular case of Cameroon, there is also a political will to maintain a balance between domestic and foreign ownership along with the legal requirement that some concessions should be set aside for nationals acting individually or grouped into companies (Forestry Law 1994, section 48). Forest concessions are transferable with the approval of the forestry administration. One possibility of transfer may arise from the abandonment of a concession by the logger. Should this occur, the Government takes the forest back and may put it on the market (Forestry Decree 1995, article 78) for re-allocation to another firm.

The right to transfer a concession is hindered by its indivisibility. The concession must be transferred as a whole, following Government approval (Forestry Decree 1995, article 75). However, the concession holder is granted the right to sign subcontracts for specific activities, such as harvesting, inventories, and silvicultural operations, as long as the ownership of the timber is not transferred to the subcontractor (Forestry Law 1994, section 51; Forestry Decree 1995, article 140). The transfer process may also hinder transferability. All transfers of concessions are subject to the payment of a special transfer fee. Furthermore, during the process, the forestry administration may change the terms of the logging contract on the basis of updated information on market prices and the potential of the forest. The transferability of products resulting from the concession is also limited. The tenure holders cannot easily reallocate their log production due to processing requirements, as every logging company is required to locally process at least 70 per cent of its log production (Forestry Law 1994, section 71). Furthermore, the government announced a log export ban to become effective at a yet undisclosed date after 2000. In the meantime, an export fee is imposed on exported logs and lumber. Restrictions on log exports were conceived to promote the development of a local industry and create local employment, while export fees are meant to collect potential economic rent in addition to stumpage fees and the area fee.

5.2.4 Duration

Under the new law, logging concessions are assigned for renewable periods of fifteen years, following the three-year probationary period (Forestry Decree 1995, article 70). The decision to renew the concession is subject to compliance by the concessionaire with the obligations related to the first fifteen years. The number of times a concession can be renewed is not specified, but there is a general agreement that at least one renewal is needed to tie the concession duration to the length of a forest rotation, which is thirty years minimum (MINEF, 1993). In other words, the first renewal is almost guaranteed if no violation of the first management agreement is reported. Subsequent renewals are more uncertain.

5.2.5 Use restrictions

The new Forestry Law (section 24) defines the dominant use of every block of forest, in accordance with the indicative zoning plan for southern Cameroon. Concessions are primarily forest reserves included in the permanent forest and devoted to logging. Therefore, concessions are subject to certain management conditions that preclude any activity likely to reduce the forest coverage, such us building houses or large roads. However, the Government maintains the rights to change use designations, if it is in the public interest (Forestry Decree 1995, article 22).

5.2.6 Size specifications

The permanent productive forest has been divided into compartments whose limits depend on the geographical and ecological characteristics of the forest (hydrology, hills, etc.). A concession may be composed of one or more compartments (Forestry Law 1994, section 46). The total forest area constituting a concession is determined on the basis of the needs of either the existing wood processing unit, or the mill to be installed, as well as the potential of the forest. As we shall explain later in this paper, the potential of the forest takes into account the actual marketable species of trees. The annual allowable cut varies in accordance with the maximum yearly harvestable area as well as the maximum volume of biomass extractable from a forest stand. The concession size cannot exceed 200,000 ha (Forestry Law 1994, section 49). The concessions awarded to date range from 30,000 to 200,000 ha. However, the area harvested during the probationary period cannot exceed 2,500 ha per year per concession. These limitations are reinforced by limited transferability and non-divisibility of concessions that supposedly prevent firms from increasing the area under their individual control. Size limitations, like transfer restrictions, aim at avoiding control of the forest by a few firms, and ensuring local entrepreneurs an access to forest resources. Given that logging activities require huge capital

investment, there is an assumption that local entrepreneurs cannot afford large concessions (Forestry Law 1994, section 48).

5.2.7 Operational requirements

Prior to any logging operations, the concessionaire is required to undertake management and pre-harvest inventories (Forestry Decree 1995, articles 42 to 43). The management inventory consists of a quantitative and qualitative evaluation of the resources in all stands within the concession. The pre-harvest inventory is an exhaustive counting of all marketable species of trees in the area to be harvested for a one-year period. The results of the management inventory are used to prepare the forest management plan and determine the harvesting sequence. In that process, ecologically sensitive areas are supposed to be identified and excluded from the concession area to ensure their protection (MINEF, 1993). The pre-harvest inventory allows mapping of individual crop trees. Regulations state the minimum diameter-cutting limit for every species, depending on the expected rate of growth and the characteristics of the individual species.

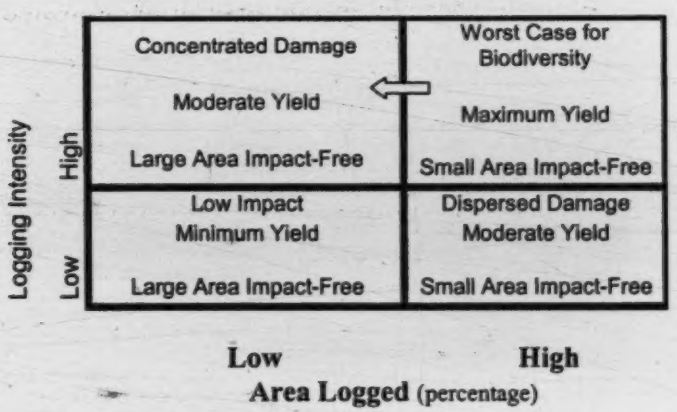
The Forestry Decree introduces the concept of an AAC termed as the annual logging potential of a forest management unit, aimed at achieving sustained yield over time. The annual logging potential corresponds to the maximum area exploitable per year and/ or the maximum volume of forest products likely to be extracted per year from a forest management unit, without reducing the production capacity of the forest (Forestry Decree 1995, article 46). In principle, the AAC of a concession determines the maximum volume that can be extracted from the concerned forest to ensure sustainable yield. It is estimated on the basis of the management inventories and plans, diameter specifications, and the principle of felling all mature trees (except seed-trees) from the official list of marketable species. The adoption of an AAC requires that the minimum (breast-height) diameter cutting limits applicable under the old policy be raised to leave sufficient adults to ensure reproduction and population maintenance

after logging. Setting a minimum number of species to be harvested aims at valorizing some currently non-marketed species. The idea is that if firms have to harvest these species, then they would need to find a market for them. It is assumed that harvesting more new species will relieve the pressure on the most valuable ones. It is also expected that when non-marketed species become tradable, the number of trees felled by accident and abandoned in the forests may decrease.

Finally, loggers are required to observe rules such as: felling in line with skidding direction to reduce ecological damages; skid trails and skids roads limited to the minimum width; pre-harvest vine cutting in areas where heavy vines connect tree crowns; removal of creepers and buttresses before felling. Moreover, harvesting may be prohibited in some areas within the concession, to preserve and maintain critical habitats for endangered species and protect ecologically sensitive sites such as streamsides. Harvesting in regenerating areas is prohibited as well. Apart from mapping of individual crop trees, and pre-harvest cutting of vines, which are typical to tropical areas, most of these practices are widely applied in temperate forests. In that sense, reduced impact logging can be seen as a transfer of well-known practices from temperate to tropical forestry.

Many of the harvesting requirements adopted in Cameroon aim at preserving the critical forest values, including its biodiversity. Figure 5.1 describes the impact of logging on biodiversity as a function of logging intensity (m^3/ha) and distribution (per cent of area logged). The objective for Cameroon would be to move from the high intensity/high area quadrant to the low area/high intensity quadrant. Damages can then be repaired using adequate silvicultural operations.

TABLE 5.1 IMPACT OF LOGGING ON BIODIVERSITY



(Source: World Bank, 2001)

The new forestry legislation is not specific about regeneration requirements of concessions. However, the Government has declared in its letter of policy (MINEF, 1993) that natural regeneration will be the rule in permanent forests and enrichment planting will be undertaken when needed. Regeneration requirements are supposedly tailored to meet the specific situation of every individual forest. For that reason, there are specific prescriptions for each concession as to the silvicultural operations to be undertaken for enhancing natural regeneration, in order to increase the volume and the quality of future harvests, and maintain the ecosystem resilience. The major operations are thinning and weeding. When some forest enrichment is required, the scope and the species are determined in common agreement between the forestry administration and the concessionaire (MINEF, 1998). Concession holders are not reimbursed for the costs of silvicultural activities. While it is implicit that the renewability of the concession provides the concessionaire with the rights to future production, the Law is

not specific as to whether stumpage fees will apply to incremental future volume[5] resulting from silvicultural investments.

The forest legislation ties timber rights to the wood processing industry (Forestry Law 1994, section 49; Forestry Decree 1995, article 61). Before the announced log export ban becomes effective, every firm is required to process at least 70 per cent of its log production within the country. Logging companies applying for concessions are required to own, operate or establish processing agreements with a local processor. The type of processing plant is included in the technical criteria of pre-selection of bidders (MINEF, 2000). Conversely, the ownership of a wood processing plant does not require tenure rights to trees. The Forestry Decree (article 115) suggests that owners of processing factories may purchase logs from the local market.

5.2.8 Operational control system

The operational control for forestry concessions in Cameroon includes both the prior approval of the management plan and the five year working plan by the Forestry Department, and later, the monitoring of their implementation by the local representatives of the forestry administration (Forestry Decree 1995, article 49). The local forestry services are also in charge of disputes that might occur between users of the same concession including local communities. But, as mentioned previously, the actual distribution of tasks between the forestry administration headquarters and their field services is not clear (Pousse, 2001). In addition to the forestry administration, the Ministry in charge of finances may also intervene in the system for tax collection. On the regulation side, the forestry decree provides a broad range of enforcement measures including monitoring tools, sanctions, suspension and cancellation of logging rights for non-compliance with the rules (Forestry Decree 1995, articles 127 to 137). These tools are the same as those used under the old policy regime. They are

[5] The incremental harvestable volume refers to the additional volume resulting from silvicultural operations that is above the natural level of biomass growth.

based on the number of trees and species harvested, the area harvested, and the quantities at mill gate. So far, the Government of Cameroon has not updated the monitoring system to take into account the new management requirements especially those related to sustainable forest management. Neither has it provided the forestry administration with the required equipment and the operational budget for the implementation of the new policy. Consequently, some of the management requirements are not being implemented especially those aiming at reducing the ecological impact of logging. This is a result of a combination of factors. First, the newness of the SFM principles, the lack of successful examples to learn from, and the limited transferable technology created confusion among staff in the forestry administration. Second, the loggers are reluctant to support the idea of sustainable forest management due to the supposed additional costs associated with it. Therefore, they do not press the Government for the enforcement of the new rules.

5.2.9 Charges and fees paid to the Government

The timber pricing strategy underlying the new forestry policy in Cameroon includes two components. One component is the area fee resulting from the bidding process and accounting for the differential rent based on the resource quality as perceived *ex-ante*. The second component consists of royalties aimed at capturing the scarcity rent based on market values of species as measured *ex-post*. The *ex-post* royalties divide into stumpage fees per cubic meter of cut tree and an export fee per cubic meter of logs or processed wood. Fees are spread throughout the different levels of timber activities, supposedly to facilitate rent collection and promote sustainable practices in forest management (MINEF, 1993). The area fee is a flat fee and does not depend on the volume of timber harvested. Stumpage fees are paid per cubic meter harvested. Stumpage fees and export fees are calculated as percentage of the FOB price of the tree species. That is, they are linked to the market value of species. In theory, the level of forestry fees is determined and announced by the annual financial law. In practice,

they were almost constant during the 1980's and have been changing at least twice a year since 1993, as the Government needed money to balance its budget accounts.

5.2.10 Security

Given that the concession system was recently introduced in Cameroon (Forestry Law, 1994), it is understandable that security is of high concern for the timber industry. Most members of industry have been in business for a long time under the previous system of five-year licenses and the advent of the new policy is troublesome for them. The main source of insecurity for tenure holders is the financial dimension of the harvesting rights. The rent collection system, including the relative importance of different taxes, the tax burden and the collection instruments, has been changing during the last decade. Another source of insecurity for loggers is that the Forestry Law does not provide for compensation in case of change in tenure arrangements. Therefore, any eventual cost inherent to a change in forest legislation is to be borne totally by the firms. There is also no provision for compensation in the case of a concession being taken by the Government.

CHAPTER 6: ECONOMIC ANALYSIS OF THE POLICY RESULTS

This chapter investigates the policy objectives of Cameroon in the forestry sector, and the results achieved over the period of the study. It contains the actual economic assessment of the policy tools and goals pursued by the government. In this chapter, we discuss the adequacy of the policy objectives set by the government, and assess the compatibility of specific objectives. We also investigate whether the policies met the three criteria of a welfare improving policy introduced in chapter two. These are: efficiency, equity and environmental soundness, the last two criteria being closely interrelated. To that end, we have presented the main features of the forestry sector in Cameroon in Chapter 3. Chapters 4 and 5 described the policy environment under the old and new policies, in a property rights framework as proposed by Haley and Luckert (1990).

This chapter is organized as follows: section 6.1 presents a compilation of objectives under the old and the new policy regimes discussed previously. Then, the compatibility and possible trade-offs between objectives are discussed. Section 6.2 presents a comparison between the potential indicators discussed in chapter two, and the actual indicators used for policy analysis throughout the following sections. Section 6.3 presents the actual assessment of policy results. It includes a comparison between the objectives and the results achieved. The assessment is carried out in two steps: a property rights analysis, and a discussion of the results of the new policy as reported in available sector reviews.

6.1. Policy objectives under the two regimes

6.1.1 Comparison of policy objectives under the two regimes

In this section, the three characteristics of a sound policy discussed in chapter two are used to compile government objectives under three headings: (i) promoting reduced

impact logging in timber concessions; (ii) developing an efficient timber industry and maximizing the sector contribution to country's economic growth; and (iii) ensuring equitable distribution of forest benefits among and between generations. Table 6.1 presents the results of the compilation of the government objectives. An "X" means the objective is part of the policy while a blank means the objective is not.

TABLE 6.1 COMPILATION AND COMPARISON OF POLICY OBJECTIVES UNDER THE TWO REGIMES

Sector Objectives	Old policy	New policy
1. Promote reduced impact logging (RIL) in concessions		X
2. Develop an efficient timber industry and increase sector contribution to economic growth	X	X
2.1 Increase log production up to sustainable harvest level		X
2.2 Improve mill log input/wood output ratio in timber processing	X	X
2.3 Increase value added in the forestry sector through (i) larger in country processing capacity, and (ii) more logs processed locally beyond sawn wood	X	X
2.4 Increase exports of forest timber products and gain more foreign currency in trade	X	X
2.5 Maximize the amount of rent collected from the sector, using a rent collection system that does not discourage firm efficiency		X
2.6 Avoid concentration of timber harvesting rights within the hands of few firms	X	X
3. Ensure equitable distribution of forest benefits		
3.1 Intra-generational (or cross-sectoral) distribution	X	X
3.1.1 Create employment especially in rural areas	X	X
3.1.2 Improve living standards in the rural areas	X	X
3.2 Inter-generational or inter-temporal distribution		X
Sustain production of forest products and services over time		X

Table 6.1 shows some changes in policy objectives over the period of the study. The new policy brought changes mainly in the area of logging practices aimed at reducing the environmental damages associated with logging activities. The new policy is also more specific about the expected contribution of the forestry sector to the nation's wealth, through a higher level of timber production and more economic rent collected from logging concessions. Finally, the new policy seeks longer-term outcomes by

introducing the requirement to sustain forest production of timber and non-timber resources over time. In contrast, the government's objective to promote an in-country forestry industry is persistent over the period of the study. Likewise, creation of rural employment, and improvement of living conditions in rural areas appear to be constant components of the government's policy over time.

6.1.2 Adequacy, compatibility, and possible trade-offs between policy objectives

Economists would agree that the three main policy objectives of Cameroon as compiled in Table 6.1 are pertinent on economic grounds. However, as with many timber-producing countries some of the specific objectives may not necessarily lead to the achievement of the overall goals; some are well intended and understandable but difficult to measure, and some may conflict with others. In this section, we discuss examples of measurement problems and conflicting objectives. Cases of specific objectives and related policies, described in terms of property rights, are discussed in section 6.3.

An example of an objective that is difficult to measure is collecting as much rent as is available in the sector, using a rent collection system that does not discourage firms' efficiency. The identification of economic rent generated by the timber industry is a complex process, and it would be difficult to say whether or not the government has been collecting sufficient fees. As mentioned earlier in this study, the government of Cameroon had chosen to collect social rents in addition to economic rent, using specific requirements. Given that complexity, the optimum amount of economic rent to be collected through fees cannot be determined precisely.

One example of a set of potentially conflicting objectives is increasing log production on the one hand, and reducing the impact of logging on non-timber values on the other. The increase in timber production prescribed by the new policy is likely to conflict with the preservation of other forest values and ecosystem services because

timber production generally brings changes in biodiversity and habitat values in the harvested area.

Another set of potentially conflicting objectives is the promotion of an efficient timber industry and the objective of sustaining timber yield over time. As discussed earlier, the AAC was introduced by the new policy in the pursuit of a sustained yield policy. But, the AAC is a biological concept based on the forest's capacity to produce timber and does not take into consideration production costs, market prices, and other factors that influence firm efficiency. Therefore, enforcing a sustained yield policy may affect firms' efficiency by limiting the responsiveness of firms to changes in market conditions (Boyd and Hyde, 1989). Compliance with the AAC limits may force firms to produce more in poor market time and less in good market times. The question from an economic standpoint is whether the incremental future benefits associated with the AAC limits are worth the loss of immediate profits.

Increasing competition in timber harvesting to avoid concentration of concessions in the hands of a few companies and control of foreign companies over the sector appears to be a common policy objective in many timber-producing countries. However, there are also tradeoffs associated with this policy. Competition is used to limit the economic losses associated with concentration while ensuring that logging activity is not totally controlled by foreign firms. However, from an efficiency standpoint, increasing the number of companies operating in the sector may induce some losses in economies of scale.

6.2 Potential indicators versus actual indicators

At both the national and the sector levels, some of the conventional indicators discussed in Chapter 2 have not been computed for Cameroon. Due to the lack of national statistical service records in Cameroon, there is a paucity of data that may be

used in describing the performance of the forestry sector. Data used in this analysis comes from various other sources, including reports from international development institutions, and sector review reports. To circumvent the absence of conventional indicators, some proxies, referred to as actual indicators, are used to measure sector performance. For some of the measures, the information may not exist for every year as the sector reviews were completed in a discontinuous manner. In those cases, the periods of the sector reviews (late 1980's and 1999) are used as reference periods to compare the changes over time. Qualitative information is also included resulting from discussions the author had with some sector players. The data limitations are dealt with as we go through each actual indicator. The conventional indicators and those used to evaluate the performance of the forestry sector appear in Table 6.2

TABLE 6.2 POTENTIAL VERSUS ACTUAL INDICATORS OF RESULTS

Government Objectives	Old policy	New policy	Potential indicators	Actual indicators
1. Promote reduced impact logging (RIL)		X	-Indicator of ecological resilience -Estimate of loss in forest cover -Rate of biodiversity loss	
2. Develop an efficient timber industry and increase sector contribution to country economic growth	X	X		
2.1 Increase log production up to the sustainable harvest level		X	-Number of species harvested - Cubic meters harvested/ha - Harvest level/AAC	- Number of species harvested - Cubic meters harvested/ha - Harvest level/AAC
2.2 Improve mill log input to wood output ratio in timber processing		X	Rate of wood recovery at factory	Rate of wood recovery at factory
2.3 Increase value added in the forestry sector through (i) larger in-country processing capacity, (ii) more logs processed locally beyond sawn wood	X	X	- Annual Value added, -Installed processing capacity - Percentage of logs processed locally	- Annual Value added, -Installed processing capacity - Percentage of logs processed locally
2.4 Increase exports of forest	X	X	Quantities and values	Quantities and values

timber products and gain foreign currencies in trade			of F.T.P exports	of F.T.P exports
2.5 Collect the rent available from the sector, using a rent collection system that does not discourage firm efficiency		X	Amount of forest fees collected	Amount of forest fees collected
2.6 Avoid concentration of timber harvesting rights within the hands of few firms	X	X	Number of firms and share of rights held	Number of firms and share of rights held
3 Ensure equitable distribution of forest benefits	X	X		
3.1Intra-generational (or cross-sectoral) distribution	X	X	HPI in rural area	
3.1.1Create employment especially in rural areas	X	X	Numbers employed	Numbers employed
3.1.2 Improve living standards in the rural areas	X	X	Rural infrastructure, schools, health centers	
3.2 Inter-generational or inter-temporal distribution		X		
Sustain production of forest products and services over time		X	Genuine savings rate for the forestry sector	Genuine saving rate for Cameroon's economy

The comparison between conventional and actual indicators presented in Table 6.2 reveals that the sector performance is evaluated in terms of indicators that are not ideal. The use of proxies in this study may lead to results that are not accurate because they are not expressed in the standard language.

6.3 Analysis of forest policy

In the following sections, policy results are analyzed by objectives, using a two-tier approach. For every policy objective, the most relevant property right dimensions are assessed to find out what results may be predictable given the old and new regulations. In that process, cases where property right dimensions are at variance with some policy objectives are also highlighted. Then, the policy results reported with conventional or actual indicators are discussed. In the analysis, the impact of some tenure characteristics is based on predictions, because these characteristics, although legally

in place, were not enforced at the time of the study. These include some elements of harvesting requirements, regeneration requirements, and the log export ban.

6.3.1 Pursuing the objective of reduced impact logging (RIL)

Performance in promoting reduced impact logging is assessed in this section through the extent of ecological damage resulting from logging, and the impact of logging on non-timber values. As mentioned in table 6.2, neither the indicator for ecological resilience, nor the indicator on biodiversity loss has been computed for Cameroon. However, the literature provides some generic information about the impact of conventional and reduced impact logging in different tropical countries that can be applied to Cameroon.

6.3.1.1 Analysis of policy results in promoting RIL

6.3.1.1. 1 Property rights analysis

In the property rights structure, the level of ecological damage, and the impact on non-timber values attained in logging are affected mainly by harvesting requirements, tenure duration and transferability.

Specific harvesting requirements directed to the protection of biodiversity did not exist under the old policy. Harvesting requirements under the old forest policy consisted solely of harvestable diameters. The additional requirements introduced by the new policy included specifications on road construction, controls on harvesting ecologically sensitive areas such as river sides, and requirements to fell in line with skidding direction, aimed at reducing damage to residual trees and to the ecosystem. However, these requirements have a shadow price; including them in the concession agreement may decrease profits to the timber operators due to the additional costs inherent to the management procedures that enhance biodiversity. In addition, any improvement in non-timber values resulting from the management operations does not benefit the firms because they do not have rights to non-timber values. Therefore,

timber operators would not likely comply with such requirements if they have no incentive to do so. Incentives for timber operators to comply might come in two forms: enforcement combined with suitable penalties and/or potential future benefits to the timber firm originating from RIL practices.

The requirements for RIL do not appear to be enforced in Cameroon (Global Forest Watch, 2000). However, the forestry literature suggests that there are potential immediate and future gains resulting from improved logging practices. These gains may provide incentives for loggers to improve logging practices if their costs are not too prohibitive, given some of the potential associated benefits (Boscolo and Vincent, 2000; Geslin, 2000; Nels and Cabarle, 1993). These authors suggest that the harvesting and regeneration requirements pertaining to RIL yield immediate benefits, such as increasing the volume of usable timber for each tree felled, by up to 30 per cent. Improved logging practices can also affect loggers' future benefits by: reducing damages to potential tree crops, reducing mortality to remaining trees by 33 per cent, reducing damage caused by skidding to residual stand by 56 per cent and logging waste by 20 per cent. In addition, well-planned and supervised logging is reported to bring lasting returns in increased logging productivity and efficiency and may increase future harvests.

Overall, the operational requirements introduced by the new Forestry Law (1994) could potentially lead to RIL. But implementation of RIL procedures may be hindered for various reasons some of which are: lack of enforcement, insufficient information and uncertainty about the potential benefits and costs.

6.3.1.1.2 Analysis of indicators

The literature does not provide any figures on losses in biodiversity or ecological resilience in Cameroon. Under the old forest regime, change in the structure, and destruction of bio-diversity, especially wildlife habitat, and negative impacts on

quality of water were reported (*Catinot, 1989;* Dudley *et al.*,1995). Global Forest Watch (2000) reported that conventional logging practices still prevailed in Cameroon under the new policy regime, causing damage to the ecosystems. In addition to destruction of bio-diversity, poaching and illegal logging are reported to have increased with the expansion of logging activities, and due to insufficient control of field activities by the forestry administration *(World Bank, 1998; Global Forest Watch, 2000).* In the absence of data, it is difficult to confirm this possibility. But, it is unlikely that biodiversity and ecological resilience have improved given that the reduced impact logging requirements in the new forest management plans are not enforced (Global Forest Watch, 2000).

6.3.2. Pursuing the objective of an efficient timber industry

Developing an efficient local timber industry has been historically a consistent objective in Cameroon forest policy, under the old and new policy regimes. This objective applies for both log production and timber processing. Performance in the pursuit of that objective is being assessed through the six sub-objectives identified in Table 6.1, related to the compilation of policy objectives.

6.3.2.1 Analysis of results in increasing log production up to the sustainable harvest level

6.3.2.1.1 Property rights analysis

An important dimension of property rights, which could affect the harvest level, is the harvesting requirement, which dictate the number of species to be harvested, and the AAC. However, it is not clear that the policies adopted will further this objective. For instance, the species requirement, which sought to increase the volume of timber harvested per ha, could yield opposite results. On the one hand, requiring firms to harvest more on a per ha basis may force them to increase harvest toward the AAC.

However, in doing this, the cost of harvesting may increase and the firm may harvest fewer ha. Also, by forcing firms to harvest logs that they would otherwise regard as being economically sub-marginal, this requirement could affect firms' efficiency negatively.

6.3.2.1.2 Analysis of indicators

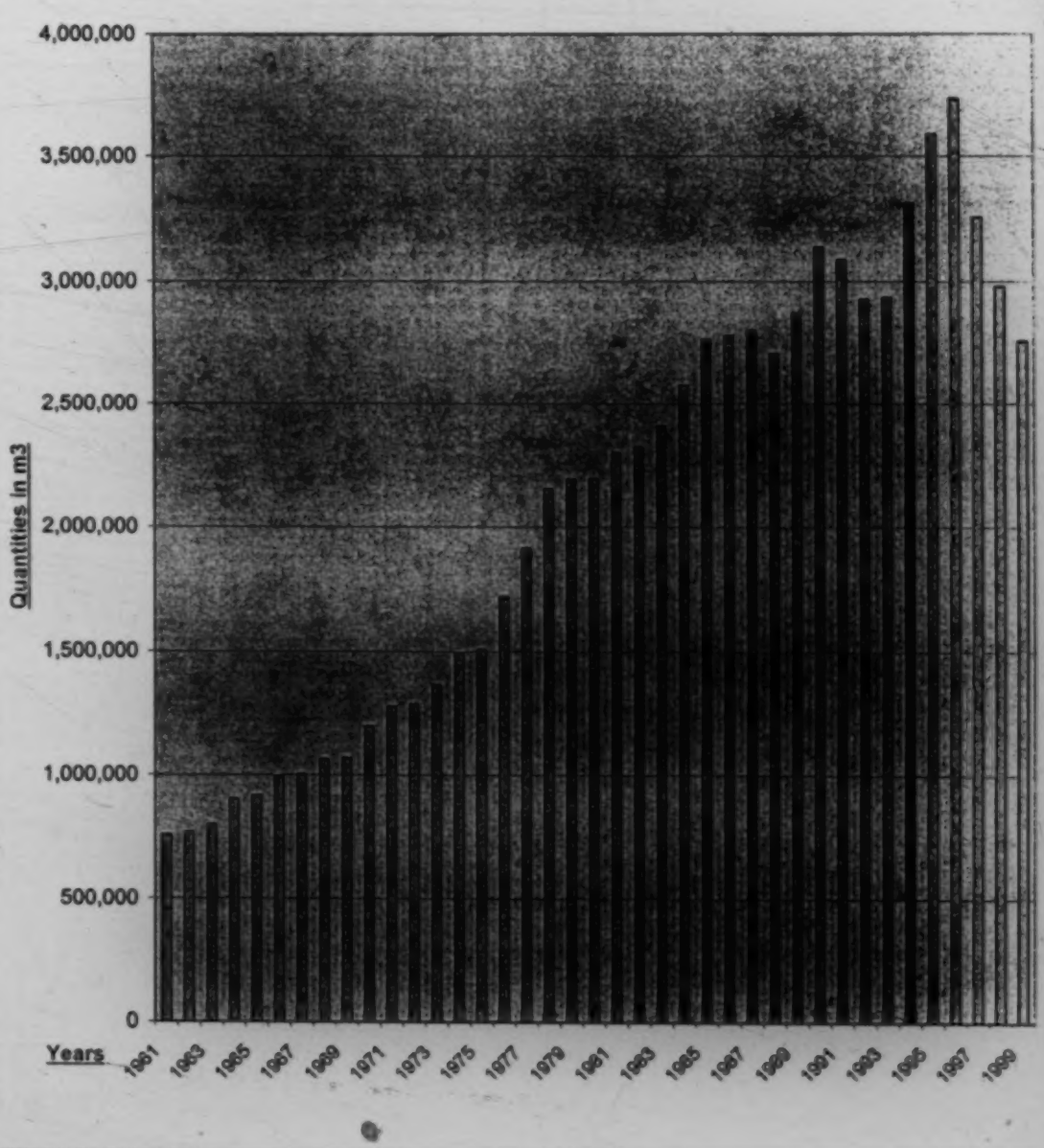
Concerning the number of species harvested in Cameroon, the available literature suggests that until the arrival of Asian logging companies in the early nineties, only three species (Sapelli, Ayous, and Azobe) out of the 300 found in the country made up 85 per cent of log production (Duchesneau, 1993; Lumet, 1993). Since the new policy came into effect, the distribution of the timber production across species has changed. The three species mentioned above are still predominant but their relative importance has decreased from 85 to 57 percent. New species such as Frake, Tali, and Iroko are traded and make up 15 per cent of total log production. It is not clear that species harvesting requirements introduced with the new Forestry Law are the cause of these changes. Other possible reasons for the change may be decreasing stocks of the three historically popular species mentioned above, the rise in international prices of the new species, or the species-differentiated forest fees system applied in Cameroon which fixes lower fees for low valued species. While an increase in species utilization has taken place, Global Forest Watch (2000) reports that the species distribution in timber production is still far from a balanced mix of the country's twenty most marketable species. The forestry administration suggests that firms do not harvest some species because they exhibit low returns, which supports the idea in the previous section that objectives to increase species utilization beyond what firms would do voluntarily may decrease efficiency.

Another indicator of progress in the objective of increasing timber production is the quantities harvested. The volume harvested is reported to have increased from five

cubic meters per hectare in the late 1980's to seven cubic meters per ha in 1999[6]. The country timber production over the period of the study is represented in figure 6.1. In that figure, the colored bar indicates the year of the change in policy.

[6] Karsenty *et al.*,(2000) reported that the total area effectively harvested in 1999, under all tenure contracts added up to 409,610 ha. For a tetal production of 2.8 million m^3, that yields an average volume of about 7 m^3 per ha.

Figure 6. 1 Log production over time



(Source FAO, 2001)

Figure 6.1 exhibits a steady annual increase in log production up to 1988. This was followed by a period of fluctuating but generally increasing log production up until 1996. A larger drop in log production occurs from 1997 through 1999. It remains to be seen whether log production will continue to decrease or begin to grow again. While the old policy appears to have been successful in allowing log production to increase, there is simply not enough data to determine what the effect of the new policy has been on log production.

6.3.2.2 Analysis of results in improving mill log input to wood output ratio in timber processing

6.3.2.2.1 Property rights analysis

One property rights characteristic that could affect policy results in improving efficiency in the timber industry is the level of fees collected by the government on logs. Grut *et al* (1991) suggests that low fees may result in low priced logs, allowing firms to survive even with inefficient logging practices, and encourage sawmills, veneer and plywood mills to substitute cheap logs for other inputs, such as labor and capital. Therefore, timber processors faced with deflated log prices would have no incentives to invest in wood saving technology. This substitution may yield low ratio of mill log input to wood output. In addition, the experience in industrialized countries has shown that low forest fees lock inefficiency in, but higher log prices have forced the forest industry to invest in new equipment in order to survive (Grut *et al.*; 1991).

In Cameroon, the level of forest fees increased during the study period. Higher amounts were collected under the new policy regime with the indexing of stumpage and export fees to the market value of each of the tree species. The Government raised forest fees under the new policy, in order to promote an efficient industry.

6.3.2.2.2 Analysis of indicators

As mentioned in table 6.2, one potential indicator for policy results in wood output to mill timber input is the rate of wood recovery at factory. That rate increased over the period of the study from an average 15 to 20 per cent in 1990 for all mills, to 25 to 33 per cent for sawmill, 50 per cent for plywood and 55 per cent for veneers in 1999 (Grut *et al.*, 1991; Duchesneau, 1993; Lumet, 1993; Carret, 1999). Although these rates indicate marked improvement, the overall performance is still somewhat low due to the predominance of saw milling, which represents 85 per cent of timber processing capacity. The results achieved in saw-milling may be due to an inadequate and outdated technology combined with the poor quality of locally processed logs, since the best logs were exported. The persistence of saw-milling may suggest that Cameroon sawn wood is more competitive than plywood and veneers. It may also well be that the combination of property right dimensions adopted by the Government under the new policy was not conducive to the development of timber processing that yield more value added than sawn wood (World Bank, 1998; Global Forest Watch, 2000).

6.3.2.3 Analysis of results in increasing value added in the forestry sector

6.3.2.3.1 Property rights analysis

The level of value added generated by the timber industry is affected by several of property rights dimensions including: tenure duration, and processing requirements. Under the old policy, the duration of tenures were short (5 years) although they were potentially renewable after expiration. The short duration probably had a negative effect on investment in the timber industry. Under the new policy, the tenure duration was extended to 15 years renewable (at least once), to lessen the gap between the lifetime of the machinery and the duration of harvesting rights.

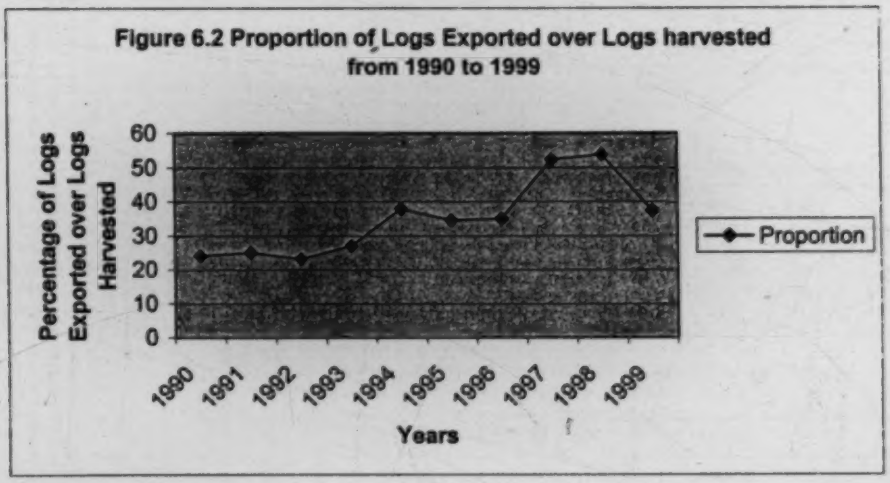
Processing requirements under the new and old forest policies have forced firms to be vertically integrated. It was expected that a larger in-country processing capacity

combined with a higher ratio of volume at mill gate to timber cut would lead to more value added in the timber industry. However, the history of development economics shows that, simply increasing the physical capital stock may not lead to more value added and growth in output (Norton and Alwang, 1993).

6.3.2.3.2 Analysis of indicators

Despite its limitations discussed in chapter two, GDP remains a popular indicator of value added. In Cameroon, the contribution of forestry sector to GDP rose from three per cent in 1992 to ten percent in 1999. This increase in GDP was supported by a rise in sector value added in real value from US$ 139 million in 1992 to $337 million in 1999 (Karsenty *et al.*, 2000; Carret, 1999). In addition, the processing capacity in the sector increased between 1992 and 1999 from 1.2 to 2.7 millions cubic meters of logs. Plywood and veneer mills, which are considered to add more value than sawmills, accounted for 15 per cent of the processing capacity in 1999; the balance being devoted to saw milling. The increase in country's processing capacity translated into an increase in lumber exports from 180 thousand cubic meters in 1992 to 476 thousands cubic meters in 1999.

However, despite the absolute increase in local processing, Figure 6.2 indicates that from 1990 to 1999, a greater proportion of logs harvested were exported. The figure suggests that the announcement in 1993 of the new processing policies, including a processing rate of 70 per cent applicable immediately and a log export ban to follow later, was followed by a significant increase (10 per cent) in log exports. Firms might have wanted to sell the existing stocks before the new regulations became applicable. Then, exports of logs went down in 1994 and 1995, following the adoption of the new Forestry Law which confirmed the processing rate. The increase in log exports observed between 1996 and 1999 may be due to the delay in implementing the announced log export ban.



(Source FAO, 2001)

Overall, the property rights set up chosen to promote value added in the sector yielded encouraging results regarding this objective. However, the predominance of log exports over logs processed locally suggests that the government's objective has been only partially achieved. That is absolute processing has gone up, but not relative amounts.

6.3.2.4 Analysis of results in increasing exports of forest timber products and gaining more foreign currency in trade

At the end of the study period in 1999, exports of timber products from Cameroon included both logs and lumber. The country was still exporting logs because, as mentioned in the previous section, the announced log export ban had not been implemented yet. The assessment of the objective in trade therefore covers both logs and lumber.

6.3.2.4.1 Property rights analysis

Four property rights dimensions could affect exports of timber products: harvesting requirements, size specifications, use restrictions, and transferability. Harvesting

requirements, especially the number of species harvested was expected to yield an increase in timber production and contribute to an increase in quantities of timber products exported. In contrast, the three other dimensions of the property rights could have combined to work against the policy objective. For instance, size specifications, which aimed primarily at preventing concentration in the sector, may have prevented some firms from expanding and achieving economies of scale in their production and export operations. Likewise, limiting the transferability of logs exports with log export fees and the *de jur*, but not *de facto*, log export ban adopted under the new policy could have limited log exports. These limitations could lead to the transfer of capital to sectors that yield higher returns. Finally, the use restrictions expressed in the zoning plan, under the new forest policy limited the sector's ability to increase both timber production and exports by preventing logging of some forest areas.

6.3.2.4.2 Analysis of indicators

One of the potential indicators to measure policy results in increasing exports of forest timber products is the value of these exports. Such values have been reported by Karsenty *et al.*, (2000), FAO (2000), and Global Forest Watch (2000). According to these sources, quantities of lumber exports have significantly increased over the whole period of the study. The real value of timber exports, including logs and lumber increased from US $ 257 million in 1990 to $ 347 million in 1999, with a peak of $ 403 million in 1997. However, it is difficult to assess to what extent this performance is due to the changes in government regulations. Actually, the export value started increasing in 1990, that is, before the new policy was adopted in 1994. One possible reason for the increase may have been the change in the structure of forest operators and changes in log and lumber prices. Therefore, it is difficult to assess the impact of the property rights set up on the variation of the value of exports of timber products during the period of the study.

6.3.2.5 Analysis of results in collecting as much rent available as possible from the timber industry

6.3.2.5.1 Property rights analysis

As discussed earlier in this study, many aspects of regulation may have affected the amount of rent generated by logging activities. These include all requirements that have a non-zero shadow price and thereby reduce firms' profits, such as limitations to transferability of timber products, species requirements, processing requirements, harvesting requirements related to biodiversity conservation, regeneration requirements, as well as the operational control system which cost is borne by the government and the firms. By reducing the transferability of logs, restrictions on log exports through export fees, or the log export ban, could depress the expected returns to timber production, and thereby, firms' profit. Likewise, the species requirement that forced firms to harvest species that they would consider of marginal value would probably reduce firms' benefits. Harvesting requirements that aimed at protecting wildlife habitat may also have induced additional costs that reduced logging profitability. Binding size specifications may also have induced costs equivalent to the forgone effects of economies of scale that companies would have gained if they had only one large concession. All these requirements, therefore, limited the amount of rent, which could be collected with fees.

6.3.2.5.2 Analysis of indicators

The amount of economic rent collected through social requirements is not easy to measure, due to the absence of an indicator that can indicate the value of all the benefits resulting from social requirements. The indicator used to assess the level of rent collected by the Government in addition to social rent is the amount of forest fees. This amount rose from US $ 37 million in 1990 to $ 60.1 million in 1998, in real values (Carret, 1999; Karsenty *et al.*, 2000). This 62 per cent increase was more than substantive given that the timber production shown in figure 6.1 above remained almost stable and did not really increase during the period under consideration.

Overall, it appears that, for the same level of timber production, not enough rent was collected before as more social rent and financial rent are being collected under the new policy regime. However, due to the difficulty in determining the right amount of economic rent to be collected, it would be difficult to say whether or not the amounts collected by the government are now optimal. It could also be that the government is collecting too much rent and thereby eroding firms' normal profits. Possible consequences of such a situation would include a decline in stock capital over time as firms fail to reinvest in depreciating machinery, and/or termination of business for marginal firms.

6.3.2.6 Analysis of results in avoiding concentration of timber harvesting rights within the hands of few firms

6.3.2.6.1 Property rights analysis

The property rights dimensions, which were most likely to affect distribution of harvesting rights among firms in Cameroon, were: transferability of tenure, size specifications and forest fees. Limited transferability and limited concession size were persistent over the period of the study. These limits were meant to constrain firms' abilities to obtain large tenures. The higher level of forest fees adopted under the new policy could also affect this distribution by favoring large firms, which have better access to capital, and forcing some marginal firms to drop out of production.

6.3.2.6.2 Analysis of indicators

The area of concession agreements in Cameroon in 1999 added up to four million hectares. Global Forest Watch (2000) reported that, at that time, the top ten of the 84 individuals and companies with active and registered concessions, held 1.5 million hectares. That is, eleven per cent of the concessionaires controlled more than 33 per cent of the concession area. This is an improvement compared to the situation that prevailed in 1989, when three logging companies held 61% of the total area under

licenses. Despite the improvement achieved under the new policy, further increases in competition may be desirable.

6.3.3 Pursuing the objective of an equitable distribution of forest benefits

The analysis of this policy objective covers three interrelated specific objectives including the creation and maintenance of employment, improving living standards in rural areas and sustaining production of timber and forest services over time. The results attained in each of these specific objectives are assessed in the following sections.

6 3.3.1 Analysis of results in creating employment especially in rural areas

6 3.3.1.1 Property rights analysis

Creation of employment by the timber industry in rural areas could be affected by the social requirements included in start up conditions, transferability and processing requirements. The number of employees was one of the criteria used to assess firms' tenders for timber harvesting rights. Therefore, firms may have bid for access to tenure by planning more jobs than would be most efficient. Furthermore, there are requirements to process logs and limit log exports, which were meant to increase value-added in Cameroon. But these social requirements have a shadow price, which may have affected firms' ability to make decisions and reduced their efficiency.

6 3.3.1.2 Analysis of indicators

The number of employed by the timber industry went up from 40 thousand in 1992, to 90 thousand in 2000 (Carret, 1999; Karsenty *et al.*, 2000). That is more than 55 per cent increase over the eight-year period. This increase is significant compared to the relatively stable log production recorded over the same period, suggesting that the

increase in employment could be due to more value added processing during the period.

6.3.3.2 Analysis of results in improving living standards in the rural areas

6.3.3.2.1 Property rights analysis.

Improving living conditions in a rural area appears to be a consistent government objective in the forestry sector. Harvesting rights were used to pursue this objective; but processing requirements were critical to its achievement. Under both the old and the new policy regimes, the tenure holder was required to build a processing plant in the logging area. The expectation was that the tenure holder would construct road, health and education infrastructure, for his business needs and the social needs of his employees; and that the neighboring communities would be given access to these indirect spin-offs of logging activities. In addition to creating local jobs, the processing units were expected to attract other private businesses to operate in the region, thereby contributing to the creation of development hubs.

6.3.3.2.2 Analysis of indicators

The available literature does not provide figures on results achieved in the improvement of living standards in the rural areas. The sector review completed in the late eighties (Catinot, 1989) indicated that spillovers from logging activities in the rural areas were not visible. The social infrastructure built to fulfill social requirements under the old policy regime was either benefiting some elite, or poorly designed. The development hubs born with the logging activity disappeared when licenses expired. In some cases, even the processing equipment was dismantled. The roads created by the loggers could not be maintained properly. Under the new policy regime, there is an increasing concentration of the timber industry in the urban areas, rather than in forest areas, for easier access to infrastructure such as electricity lines, railway or the loading ports. Firms that have acquired many concessions under different names choose a

convenient area to install a large processing plant, which absorbs logs coming from logging concessions. In many cases then, they create and maintain a processing unit in the harvesting area, just to comply with the regulations. This change in the location of the main processing units may in the long run reduce the contribution of the timber industry to the improvement of living standards in rural areas. However, it would be interesting to be able to compare the amount of economic rent generated by city-based processing units and the social rent associated with development hubs.

6.3.3.3 Analysis of results in sustaining production of forest products and services

6.3.3.3.1 Property rights analysis.

Harvesting requirements largely influenced the achievement of this policy objective. Pearce (1993) suggested that, harvesting is the most important part of resource management because the manner of harvesting affects the productivity of the stock and its capacity to rejuvenate, and often impacts non-timber forest resources as well. Under the old forest policy regime, there were no harvesting requirements apart from the minimum harvestable diameters. The harvesting requirements introduced by the new law, including the rotation cycle, the AAC, the protection of critical habitat for endangered species were expected to induce better results in sustaining forest productive functions over time. By forcing the loggers to leave more trees standing, the AAC resulting from new minimum harvest diameters requirements could have contributed to the perpetuation of the timber resource and, to some extent, to continuous production.

In contrast, some dimensions of the property rights were likely to work against this policy objective. Perpetuation of productive forests depends on the firm's ability to recover the cost of the required silvicultural investments. But firms' ability to recover the said cost in turn depends on property right constraints such as the duration and security of tenure. These types of constraints dictate whether or not firms hold equity

share in future timber crop. The issue is, if tenure holders hold no equity share in future timber crop, they may limit their investment to the minimum requirements imposed on them rather than undertaking socially optimum silvicultural operations. The absence of rights to future crop may limit firms' incentives to worry about the future forest (Luckert, 1998).

6.3.3.3.2 Analysis of indicators

There is very little information available on the policy results in sustaining forest capacity to produce timber and other non- timber products. As mentioned in Chapter 2, the genuine saving rate is one of the ideal tools to measure a forest policy performance. The rate of genuine savings in Cameroon constantly decreased from six per cent in 1980 to minus 10 percent in 1990, indicating that the country's resource stocks were being liquidated and dissipated under the old policy regime (World Bank, 1992). That means, Cameroon was already consuming its patrimony, reducing the level of output that was not consumed and available to provide welfare in the future. However, these figures include all the country's renewable and non-renewable resources, as well as human made capital. They may have been dominated by figures in oil production and may not reflect sustainability for forest use. Still, given the poor logging practices reported in the country, and echoed earlier in section 6.3.2, Cameroon could be depleting not only its substitutable capital as measured by genuine savings, but also reducing its critical natural capital. The genuine savings became positive in 1995 and rose up to seven percent of GDP in 1999 (World Bank, 2001).

CHAPTER 7. SUMMARY AND CONCLUSIONS

7.1 Summary of discussion

The objective of this study was to undertake an economic assessment of the policy goals pursued in the forestry sector in Cameroon and the tools chosen by the government to achieve its goals. This has proven to be a difficult task. As with many timber-producing countries, the forest policy in Cameroon has to address many objectives, some of which are conflicting with others, many of which are difficult to measure. The evaluation of policy results is further complicated by the lack of reliable data to accurately measure some of the objectives. The analysis suggests that the importance of forests continues to be promoted over the study period from (1989 to 1999), with emphasis on value-adding processing and increasing sector productivity in order to improve living conditions in rural areas. In addition, there is an increasing concern about perpetuation of the resources. It also appears that these predominant government's objectives in the forestry sector are driven by the search for efficiency in timber production; and intra-generational and intergenerational equity in the distribution of forest benefits, especially under the new policy regime. It is shown that the government had to deal with trade offs between efficiency and equity in the simultaneous pursuit of its objectives. But it is not obvious whether the government has been able to find the right balance between opposing objectives.

The government of Cameroon used regulations as the main instrument to achieve its policy objective in the forest sector. These regulations were translated into a combination of property rights dimensions more or less attenuated. In this study, ten dimensions of property rights, which are postulated to have an impact on policy results, were identified. These include: start up conditions, comprehensiveness and exclusiveness, transferability, duration, use restrictions, size specifications, operational requirements, charges and fees paid to the government, operational control system, and security. Some of these property rights dimensions were enforced under the two policy regimes, including limitations on the transferability of the forest, limitation in

duration, and size specifications. Some dimensions were not enforced, especially the processing requirements. The harvesting, regeneration and ecological requirements brought in by the new policy, were not enforced during the study period. Discussions also suggest that some property rights dimensions were at variance with policy objectives, while others were likely to yield the expected results.

For every policy objective, relevant dimensions of property rights have been assessed to find out what results could occur. A few dimensions seem to have specific problems. For the objective of promoting reduced impact logging, the existing literature suggests that the potential immediate and future gains of RIL could encourage firms to adopt new logging practices despite the additional costs to be borne by the firms. However, the government was apparently not convinced of these arguments as they adopted operational requirements, presumably to ensure RIL. Yet, firms did not adopt RIL. Reasons for non-adoption may be related to insufficient information and/ or insecurity about the costs and benefits, combined with lack of enforcement. Whatever the reasons, the expected results could not be attained. Concerning the objective of promoting an efficient industry, the combination of property rights dimensions contained both favorable dimensions and those that run counter to the objective. Overall, the associated regulation yielded improvements in the mill log input to wood output ratio, in value adding, as well as in the quantities and the value of timber exports. But, the predominance of saw milling over more value-adding processing types suggest that firms may not have had enough incentives to invest in capital goods and technical progress. Finally, it appeared that not enough rent was collected under the old policy regime, but more social rent and forest fees are being collected after the policy change. On the distributional side, the sector review (Catinot, 1989) suggested that the results in improving living standards in rural areas were not long lasting under the old policy because the spillovers from logging used to disappear when licenses expired. The property right analysis revealed that the new regulation was equity oriented to a great extent: harvesting, regeneration, employment

requirements introduced by the new law were favorable to the objective of ensuring either intra-generational or intergenerational equity. However, in the absence of relevant data, it would be difficult to say whether the expected distributional benefits were sufficient to let go some efficiency gains.

7.2. The policy implications

The main policy implications arising from the findings summarized above are related to the predominant policy objectives: reduced impact logging, sector industrialization, and improvement of living standards. Significant improvements have been achieved especially for the two last objectives. The performance may not have been optimal due to a combination of factors including the existence of conflicting objectives, the property rights set up, and the level of enforcement of some property right dimensions. However, it would have been difficult for the government to prioritize among all these specific objectives, which are individually socially relevant.

7.3 Limitations and recommendations for further study

This study has assessed some predictable and actual results of policy objectives in the forestry sector on the basis of the property rights set up in force in Cameroon. Information provided in this study can help policy makers deal with the conflict between some specific policy objectives, and review the property rights dimensions that are at variance with the forest policy. This information may also be useful in prioritizing specific objectives in order to handle the eventual trade offs.

Limitations to the findings of this study can be seen from two angles. The first limitation is that its findings are not always supported by quantitative data. Due to data limitations, we have not been able to express the results achieved towards sector objectives using the usual indicators of policy efficiency, equity, and environmental soundness. This limitation is detrimental to the government, because they do not have a feedback on the sector performance to compare their achievements and damages to

those of other sectors or other timber producing countries. The other limitation is generated by the non-enforcement of some property rights dimensions. As mentioned earlier, some dimensions of tenures are not yet enforced. Property rights yield no effect in the absence of adequate institutional arrangements and associated organizational mechanisms, and adequate administrative capacity to enforce.

With respect to further research in this area, the first task that would contribute to a better evaluation of the forestry sector performance is the adoption of an adequate monitoring system that would generate quantitative data to support the above findings. Another area for research would be a further analysis to evaluate how alternative set up of property rights could have affected policy objectives in Cameroon.

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APPENDIX A

LIST OF THE MAJORS LOGGING FIRMS OPERATING IN CAMEROON AND THE AREA CRONTROLLED

COMPANY (Subsidiaries)	Licenses hold in 1989 (000 ha)	% of area under licenses	Concession area hold in 1999 (000ha)	% of concession area	Source of Capital
THANRY (CIBC, SAB, SEBC, CFC, Prenant)	500	23%	650	16 %	French
BOLLORE (La Forestière de Campo, SIBAF)	200	9.5%	412	10 %	French
Coron	N.A		212	5%	French
ALPI (Alpicam, Grumcam)	N.A		204	5%	Italian
HAZIM (SFH)	N.A		157	4%	Lebanese
ROUGIER (SFID)	600	28.6	132	3%	French
Decolvenaere (SOTREF, SFIL)	N.A		75	2%	Belgian
Itallegno (ECAM)	N.A		69	2%	Italian
Vasto-Legneault (SEFAC)	N.A		63	2%	Italian
Pasquet (Pallisco)	N.A		61	1%	French
Others	800	38%	2,019	50%	
Total	2,100	100%	4,054	100%	

(Source: Catinot, 1989; Global Forest Watch, 2000)

APPENDIX B.

Cameroon: Timber production and exports from 1961 to 1999					
Year	Log Production (m^3)	Log Exports (m^3)	Log Export (US $)	Lumber Exports (m^3)	Lumber Exports (US $)
1961	758000	164700	4780000	16300	1368000
1962	769000	156800	4931000	16700	1373000
1963	799000	206600	6204000	15700	1212000
1964	903000	228300	7454000	17000	1333000
1965	917000	218400	7733000	17000	1349000
1966	994000	285900	9274000	30700	2018000
1967	1003000	279300	10528000	30800	1929000
1968	1064000	364400	13850000	42200	2680000
1969	1069000	425500	14220000	46400	2573000
1970	1195000	511200	15437000	50800	2567000
1971	1276000	546300	16839000	62900	3082000
1972	1287000	515000	17628000	69300	3619000
1973	1365000	703000	45526000	80700	5337000
1974	1493000	647000	49043000	96000	8686000
1975	1507000	472000	30756000	94800	10423000
1976	1721000	598600	48554000	151500	18574000
1977	1915000	396700	32500000	104600	13891000
1978	2154000	654300	78516000	129400	19305000
1979	2194000	843400	101208000	137900	25616000
1980	2196000	743300	113873000	162600	34373000
1981	2300000	443700	55518000	106900	20499000
1982	2324000	447800	45811000	105600	15938000
1983	2411000	391000	34431000	69600	9827000
1984	2576000	496000	33347000	91000	13732000
1985	2765000	745700	64300000	128800	19100000
1986	2779000	411200	37000000	70000	11536000
1987	2803000	442000	47663000	63000	14870000
1988	2708000	537600	74611000	93300	21778000
1989	2872000	456700	71733000	65600	17000000
1990	3136000	756000	180492000	183000	59716000
1991	3085000	770825	156748000	252800	57600000
1992	2928000	679864	205029000	180000	58459000
1993	2936000	791500	137534000	187000	53376000
1994	3311000	1255000	161426000	286466	109190000
1995	3588000	1236000	303844000	222100	104898000
1996	3733000	1307000	266627000	316200	130646000

1997	3255000	1706000	237136000	356000	176576000
1998	2980000	1604000	118326000	242000	123420000
1999	2757000	1031100	154265000	476000	195750000